1987
ALBERTA HOUSE COST COMPARISON STUDY

Executive Summary

Single Detached Dwelling
24 Unit
Walk-up Apartment

Alberta
MUNICIPAL AFFAIRS
Housing Division

1987 ALBERTA HOUSE COST COMPARISON STUDY

EXECUTIVE SUMMARY

NOVEMBER 1987

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PREFACE

The main purpose of the 1987 Alberta House Cost Comparison Study is to provide estimates of the hard construction costs of a prototypical single-detached dwelling and a 24 unit walk-up apartment in nine urban centres in this Province.

The study also compares 1987 residential construction costs with those of previous years in the selected urban centres. Most emphasis is given to a comparison of 1987 with 1986 costs and the study includes an analysis of these differences.

The 1987 study has been carried out by Helyar & Associates and is documented in three reports:

1987 Alberta House Cost Comparison Study : Executive Summary
1987 Alberta House Cost Comparison Study : Single-Detached Dwelling
1987 Alberta House Cost Comparison Study : Walk-Up Apartment

Additional copies of any of these reports can be ordered from :

ALBERTA MUNICIPAL AFFAIRS
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1.0 INTRODUCTION

1.0 INTRODUCTION

1.1 Objectives

The objectives of the 1987 Alberta House Cost Comparison Study were:

1. To determine 1987 hard residential construction costs in selected urban centres in Alberta.
2. To determine reasons for differences in residential construction costs in the selected centres.
3. To carry out detailed comparisons of 1987 residential construction costs with 1986 residential construction costs in the selected centres.
4. To determine and comment on residential construction cost trends over the last eight years in the selected centres.

1.2 Scope of Work

The 1987 Alberta House Cost Comparison Study examines the construction costs of a typical single-detached dwelling and a 24 unit walk-up apartment building.

The study has been documented in three reports : an Executive Summary, a report on a typical single-detached dwelling and a report on a walk-up apartment. This report is the Executive Summary.

The study examines building construction costs in the following centres:

1. Edmonton
2. Calgary
3. Red Deer
4. Fort McMurray
5. Grande Prairie
6. Hinton
7. Lethbridge
8. Medicine Hat
9. Lloydminster

1.0 INTRODUCTION

1.2 Scope of Work (continued)

The cost analysis of both the single-detached dwelling and the walk-up apartment examines the building construction cost differences between each of the centres and highlights the reasons for those differences with reference to such factors as :

a) material costs,
b) labour costs, and
c) building features and inclusions.

The cost estimates of the single-detached dwelling for each centre include all structural, finishing, mechanical, and electrical work as shown on the drawings and included in the specifications, and also include allowances for site overhead. The cost estimates exclude the following items :

a) cost of land and site clearance,
b) site servicing costs,
c) site development costs,
d) design fees and expenses,
e) legal fees and expenses, and
f) marketing and real estate financing costs,
g) appliances (fridge and stove), and
h) general contractor's overhead and profit.

1.0 INTRODUCTION

1.2 Scope of Work (continued)

The cost estimates of the walk-up apartment for each centre include all structural, finishing, mechanical, and electrical work as shown on the drawings and included in the specifications, and also include allowances for site overhead and contractors'overhead and profit. The cost estimates exclude the following items:

a) cost of land and site clearance,
b) site servicing costs,
c) site development costs,
d) design fees and expenses,
e) legal fees and expenses, and
f) marketing and real estate financing costs,

1.3 Approach

The building construction costs are detailed in the report under the headings of labour and material/equipment costs. Labour rates used in the report are either those established by the trade union concerned, or by the market where trade union rates do not apply. In most cases, a realistic assessment of labour rates has been established by examining the circumstances of the particular sub-trade within the building industry. Material prices have been evaluated from building materials suppliers' lists. Average discounts are applied in order to establish a realistic market price for the materials to contractors.

1.0 INTRODUCTION

1.3 Approach (continued)

The research carried out in this study identified some differences between the material quantities used in previous studies and quantities estimated in this study. However, in order to enable comparisons between 1987 estimated costs and previous years' costs on a consistent basis, previously indentified quantities were used to estimate 1987 construction costs.

The cost data are assembled by sub-trade and presented in 22 trade categories for the single-detached dwelling and 25 trade categories for the walk-up apartment. The sub-trade operations are combined within each trade category in order to reflect current estimating practice within the industry. Site overhead and general contractor's office overhead and profit are shown separately for the walk-up apartment to indicate the actual site costs.

A computer program was developed in order to collate and present the cost data which were assembled for the nine centres. The quantities and trade descriptions were initially established for the prototypical house and apartment building. The cost data applicable to the relevant quantities and trade descriptions for each centre were then processed by computer.

The cost effects of market forces and building industry conditions are addressed in the "Findings" section of this report.

1.0 INTRODUCTION

1.4 Findings

Alberta's economy is experiencing slow to moderate growth as activity and optimism are climbing in the oil industry. Unemployment is down provincially and so are interest rates which may be causing more people to spend their dollars. Of course there are great variances from centre to centre within the Province. Housing starts in the Province increased, but again the variance between centres is great.

Costs for the prototypical single-detached house have increased by an average of 10.9% province-wide. The greatest increase was 20.7% in Calgary and the lowest was 7.5% in Lloydminster.

Costs for the apartment construction have increased in all centres by an average of 7.8% . The greatest increase was 12.0% in Calgary and the smallest increase was 6.2% in Hinton.

The graphic presentation of construction costs of the single-detached dwelling in Table SD.7 indicates that construction costs in all centres have moved above 1981 nominal dollars (from an average 1981 cost of $ 42,304 to an average 1987 cost of $ 46,645 or 10.3% more. However, expressed in terms of inflation adjusted 1987 dollars , costs have fallen dramatically from $ 55,968 to $ 46,645, an 16.7% drop.

The graphic presentation of apartment construction costs in Table WA.8 indicates that average costs are still less than 1981 costs expressed in nominal dollars (from $31,529 in 1981 to $31,427 in 1987 or 0.3% less). Expressed in inflation adjusted 1987 dollars, the total average costs are 24.7% less than the 1981 costs (i.e.; from $41,713 in 1981 to $31,427 in 1987).

1.0 INTRODUCTION

1.4 Findings (continued)

Labour costs for the single-detached dwelling increased substantially in both Calgary (28.1%) and in Red Deer (17.4%) as both centres have experienced shortages of skilled labour in relatively high demand market-places. Labour costs increased an average of 7.5% in the other centres.

Material prices for the single-detached dwelling and the walk-up apartment building have increased in all centres. Lumber, siding, and roofing increased most significantly over the last year. Most materials have increased in price due to greater demand caused by the highest housing starts in Canada in ten years. Most of the increase in starts occurred in central Canada and British Columbia. Concrete prices continue to vary considerably from centre to centre, due to demand, location and availability of aggregates and cement. In most centres the majority of price increases were passed on to consumers ; in previous years, builders absorbed some increases to remain competitive in the marketplace.

No significant changes were observed as a result of building practice changes or changes in standard materials used by the majority of builders.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE - DETACHED DWELLING

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 1 : Total Building Costs

ITEM	EDMONTON		CALGARY		RED DEER		FORT McMURRAY		GRANDE PRAIRIE		HINTON		LETHBRIDGE		MEDICINE HAT		LLOYDMINSTER	
ELEMENT	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%
Labour	10,604	25.2	12,438	26.7	12,143	26.5	14,642	27.9	12,985	26.7	13,473	28.4	11,936	26.7	11,747	26.1	12,224	26.1
Material	31,526	74.8	34,168	73.3	33,697	73.5	37,918	72.1	35,670	73.3	33,940	71.6	32,753	73.3	33,340	73.9	34,594	73.9
* Total 1987	42,130	100.0	46,606	100.0	45,840	100.0	52,561	100.0	48,655	100.0	47,416	100.0	44,691	100.0	45,086	100.0	46,816	100.0
Cost per m2	$421.30		$466.06		$458.40		$525.61		$486.55		$474.16		$446.91		$450.86		$468.16	
Cost per SF	$39.14		$43.30		$42.59		$48.83		$45.20		$44.05		$41.52		$41.89		$43.49	
Total 1986	$38,797		$38,616		$39,829		$47,773		$44,948		$43,876		$40,766		$40,947		$43,546	
Changes From 1986	8.6%		20.7%		15.1%		10.0%		8.2%		8.1%		9.6%		10.1%		7.5%	

* Several total figures may appear as not added correctly. This is due to the rounding effect in the calculations of the detail costing for each centre.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 2 : Comparative Cost Ratios *

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
EDMONTON	1.00	1.11	1.09	1.25	1.15	1.13	1.06	1.07	1.11
CALGARY	0.90	1.00	0.98	1.13	1.04	1.02	0.96	0.97	1.00
RED DEER	0.92	1.02	1.00	1.15	1.06	1.03	0.97	0.98	1.02
FORT McMURRAY	0.80	0.89	0.87	1.00	0.93	0.90	0.85	0.86	0.89
GRANDE PRAIRIE	0.87	0.96	0.94	1.08	1.00	0.97	0.92	0.93	0.96
HINTON	0.89	0.98	0.97	1.11	1.03	1.00	0.94	0.95	0.99
LETHBRIDGE	0.94	1.04	1.03	1.18	1.09	1.06	1.00	1.01	1.05
MEDICINE HAT	0.93	1.03	1.02	1.17	1.08	1.05	0.99	1.00	1.04
LLOYD-MINSTER	0.90	1.00	0.98	1.12	1.04	1.01	0.95	0.96	1.00

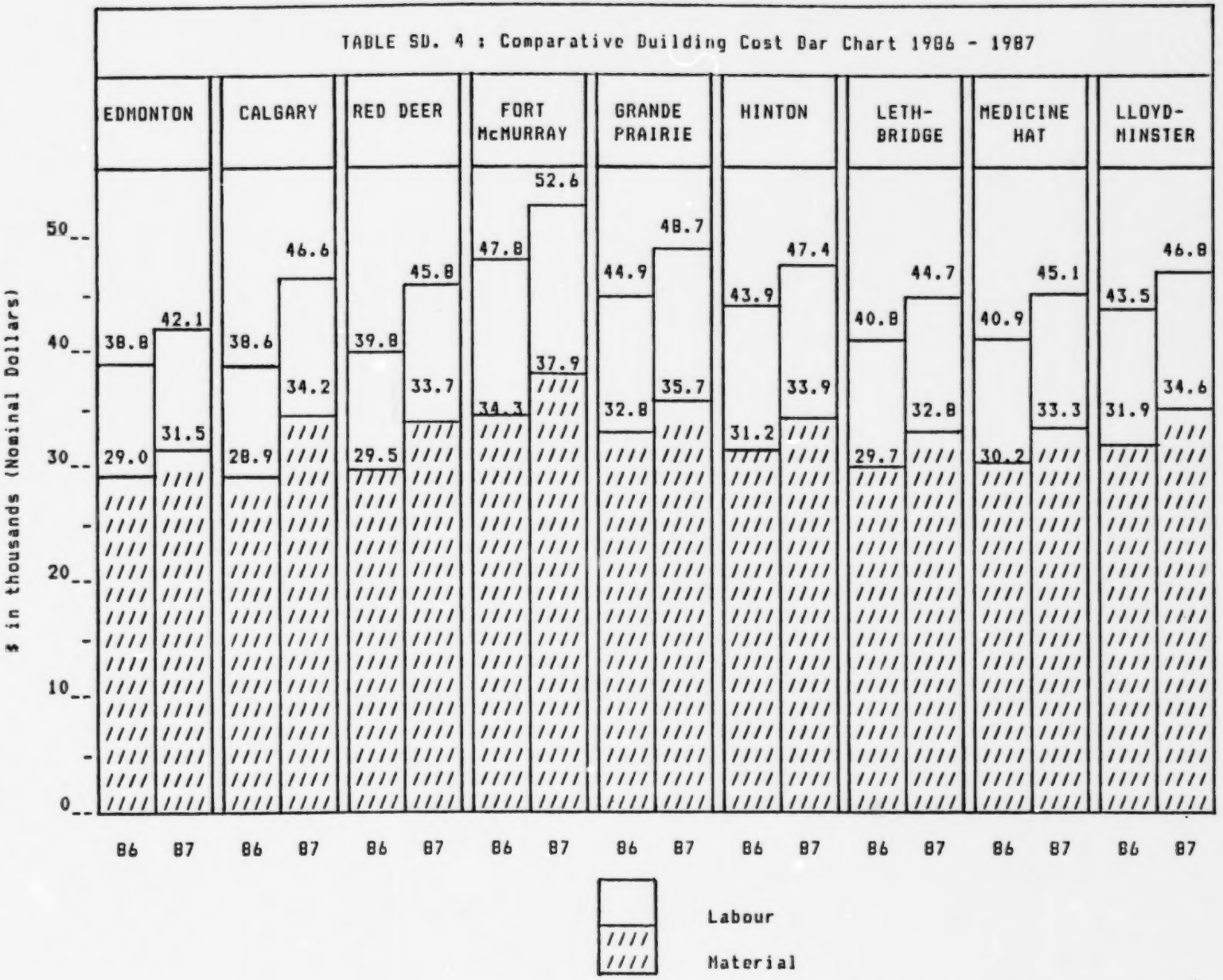
* Entries refer to the ratio of the price for a city in the top row of the table divided by a price for the city listed in the column. For example, Red Deer costs are 1.09 times Edmonton costs.

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 3 : Comparative Cost Table 1986 - 1987

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Labour Cost									
1987	$10,604	$12,438	$12,143	$14,642	$12,985	$13,473	$11,936	$11,747	$12,224
1986	$9,782	$9,713	$10,347	$13,460	$12,156	$12,719	$11,063	$10,740	$11,624
Difference	822	2725	1796	1182	829	754	873	1007	600
% Difference	8.4%	28.1%	17.4%	8.8%	6.8%	5.9%	7.9%	9.4%	5.2%
Mat'l Cost									
1987	$31,526	$34,168	$33,697	$37,918	$35,670	$33,940	$32,753	$33,340	$34,594
1986	$29,014	$28,903	$29,482	$34,313	$32,791	$31,157	$29,703	$30,207	$31,921
Difference	2512	5265	4215	3605	2879	2783	3050	3133	2673
% Difference	8.7%	18.2%	14.3%	10.5%	8.8%	8.9%	10.3%	10.4%	8.4%
Total Cost									
1987	$42,130	$46,606	$45,840	$52,561	$48,655	$47,416	$44,691	$45,086	$46,816
1986	$38,797	$38,616	$39,829	$47,773	$44,948	$43,876	$40,766	$40,947	$43,546
Difference	3333	7990	6011	4788	3707	3540	3925	4139	3270
% Difference	8.6%	20.7%	15.1%	10.0%	8.2%	8.1%	9.6%	10.1%	7.5%

2.0 SUMMARY OF FINDINGS FOR THE SINGLE - DETACHED DWELLING



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 5 : Comparative Total Building Costs 1980 -1987 *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$38,991	$36,239	$34,964	$37,206	$45,747	$42,143	-	$38,055	$38,586	-
1981	$42,304	$39,925	$39,578	$40,159	$48,339	$44,655	-	$41,910	$41,561	-
1982	$41,029	$37,732	$36,894	$40,432	$46,257	$40,814	$42,453	$41,546	$42,102	-
1983	$38,565	$35,723	$34,953	$36,941	$43,021	$40,449	$39,676	$38,427	$39,326	-
1984	$39,757	$35,764	$35,529	$36,540	$45,129	$42,601	$41,421	$38,733	$39,743	$42,351
1985	$40,528	$37,269	$37,341	$38,377	$45,564	$42,785	$41,660	$39,485	$39,521	$42,749
1986	$42,122	$38,797	$38,616	$39,829	$47,773	$44,948	$43,876	$40,766	$40,947	$43,546
1987	$46,645	$42,130	$46,606	$45,840	$52,561	$48,655	$47,416	$44,691	$45,086	$46,816

Notes : * Expressed in nominal dollars
** Hinton was not included in the 1980 and 1981 studies
*** Lloydminster was not included in the 1980 through 1983 studies

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

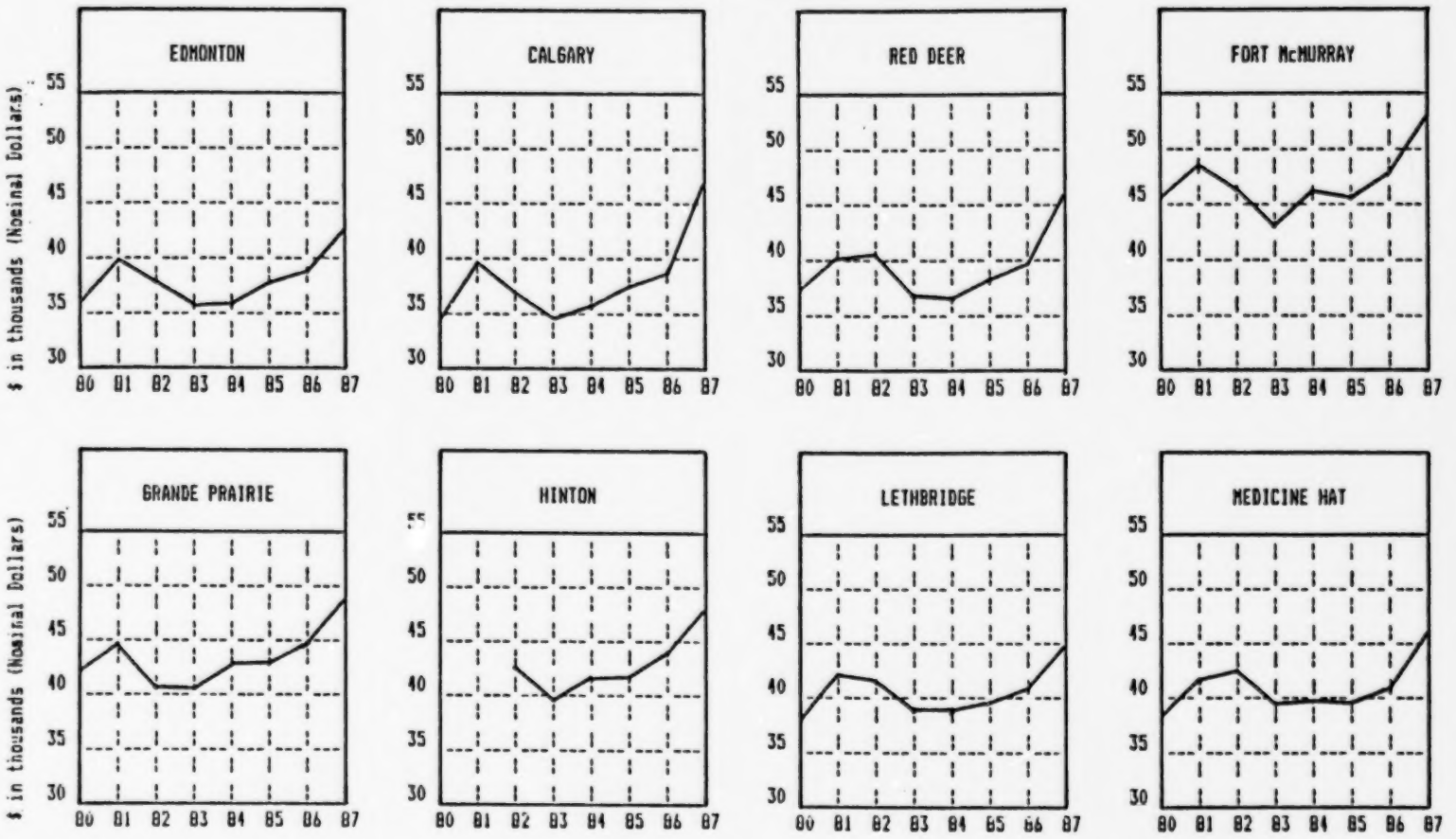
TABLE SD. 6 : Comparative Cost per Square Foot of Gross Floor Area 1980 - 1987 *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$36.22	$33.66	$32.48	$34.56	$42.50	$39.15	-	$35.35	$35.85	-
1981	$39.30	$37.09	$36.77	$37.30	$44.91	$41.48	-	$38.93	$38.61	-
1982	$38.10	$35.05	$34.27	$37.56	$42.97	$37.82	$39.44	$38.60	$39.11	-
1983	$35.83	$33.19	$32.47	$34.32	$39.97	$37.58	$36.86	$35.70	$36.53	-
1984	$36.95	$33.24	$33.02	$33.96	$41.94	$39.59	$38.50	$36.00	$36.94	$39.36
1985	$37.65	$34.62	$34.69	$35.65	$42.33	$39.75	$38.70	$36.68	$36.72	$39.71
1986	$39.13	$36.04	$35.88	$37.00	$44.38	$41.76	$40.76	$37.87	$38.04	$40.46
1987	$43.33	$39.14	$43.30	$42.59	$48.83	$45.20	$44.05	$41.52	$41.89	$43.49

Notes : * Expressed in nominal dollars
** Hinton was not included in the 1980 and 1981 studies
*** Lloydminster was not included in the 1980 through 1983 studies

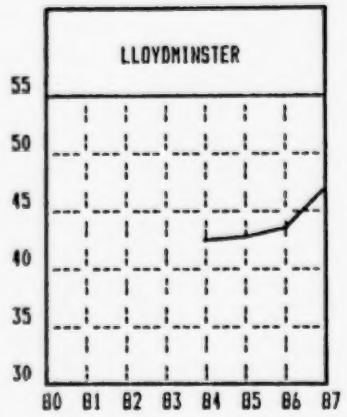
2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 7 : Comparative Total Cost Graphs 1980 -1987



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 7 : Comparative Total Cost Graphs 1980 -1987 (Continued)



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 8 : Comparative Total Building Costs 1980 -1987 (Inflation Adjusted Dollars) *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$58,370	$54,250	$52,341	$55,697	$68,483	$63,088	-	$56,968	$57,763	-
1981	$55,968	$52,821	$52,362	$53,130	$63,952	$59,079	-	$55,447	$54,985	-
1982	$49,111	$45,165	$44,162	$48,397	$55,370	$48,854	$50,816	$49,731	$50,396	-
1983	$42,807	$39,653	$38,798	$41,005	$47,753	$44,898	$44,040	$42,654	$43,652	-
1984	$44,130	$39,698	$39,437	$40,559	$50,093	$47,287	$45,977	$42,994	$44,115	$47,010
1985	$43,770	$40,251	$40,328	$41,447	$49,209	$46,208	$44,993	$42,644	$42,683	$46,169
1986	$43,765	$40,310	$40,122	$41,382	$49,636	$46,701	$45,587	$42,356	$42,544	$45,244
1987	$46,645	$42,130	$46,606	$45,840	$52,561	$48,655	$47,416	$44,691	$45,086	$46,816

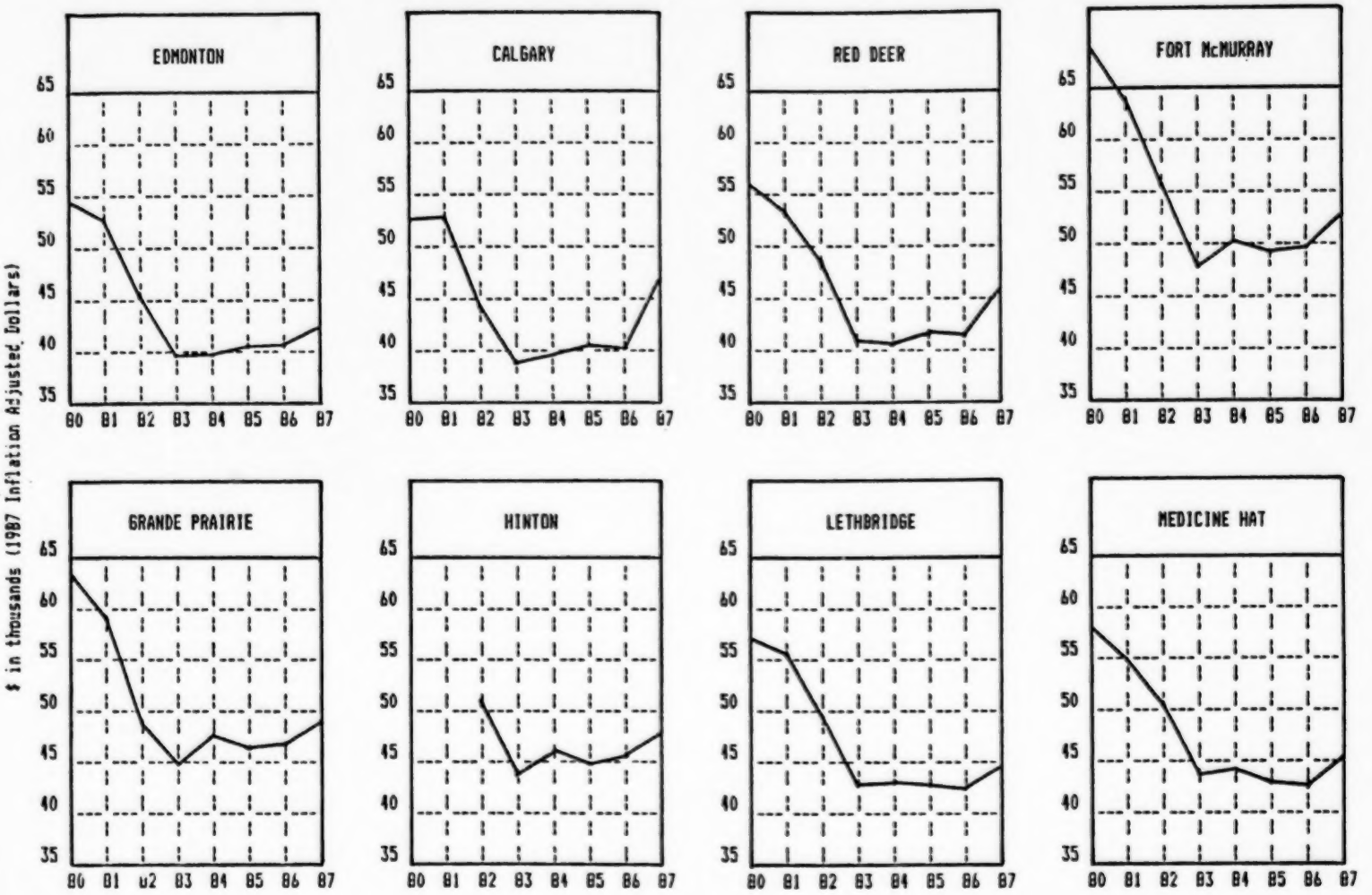
Notes : * 1. Expressed in 1987 Inflation adjusted dollars
2. Inflation adjustments have been based on the Consumer Price Index for Edmonton and Calgary.

** Hinton was not included in the 1980 and 1981 studies

*** Lloydminster was not included in the 1980 through 1983 studies

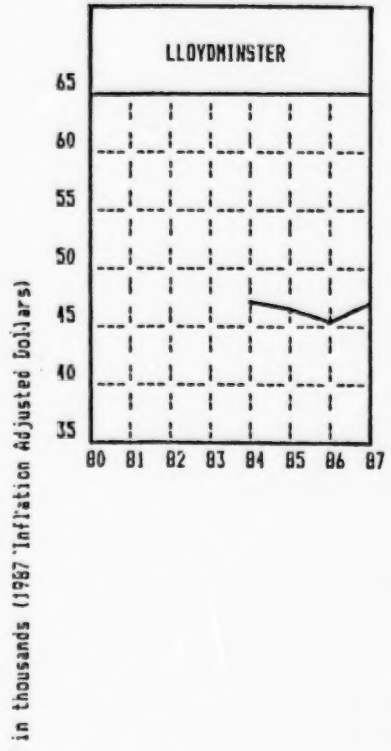
2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 9 : Comparative Total Building Cost Graphs 1980 -1987 (Inflation Adjusted Dollars)



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 9 : Comparative Total Building Cost Graphs 1980 -1987 (Inflation Adjusted Dollars)



2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 10 : Trade Division Cost Summaries

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Divisions									
1. Excavation	831	1,319	1,083	1,245	997	918	1,113	907	1,142
2. Concrete	5,519	5,930	5,895	7,548	6,808	7,163	5,506	6,019	6,017
3. Damproofing	350	451	471	601	551	448	454	435	433
4. Siding	2,711	2,682	3,035	3,191	2,910	2,622	2,719	2,435	2,903
5. Roofing	1,137	1,222	1,204	1,164	1,158	1,093	1,131	1,177	1,047
6. Rough Carpentry	9,086	10,074	9,554	11,057	10,273	9,440	9,449	9,011	9,052
7. Finish Carpentry	808	914	875	951	913	822	838	838	845
8. Windows and Glazing	1,767	1,870	1,868	2,000	1,931	1,858	1,823	1,860	1,868
9. Sealants	56	76	65	68	68	61	55	59	60
10. Doors	1,070	1,117	1,116	1,251	1,217	1,208	1,103	1,100	1,194
11. Hardware	186	209	201	209	197	196	189	196	194
SUB - TOTAL	$23,521	$25,864	$25,367	$29,285	$27,023	$25,829	$24,380	$24,037	$24,755

2.0 SUMMARY OF FINDINGS FOR THE SINGLE-DETACHED DWELLING

TABLE SD. 10 : Trade Division Cost Summaries (cont'd)

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Divisions									
12. Ceramic Tiling	190	199	197	239	229	215	220	229	272
13. Wallboard	3,938	4,609	4,257	5,329	4,558	4,665	4,206	4,313	5,050
14. Flooring	1,421	1,536	1,546	1,665	1,620	1,527	1,475	1,513	1,541
15. Painting	1,360	1,553	1,563	1,736	1,624	1,643	1,653	1,689	1,663
16. Fitting	2,501	2,704	2,690	2,946	2,746	2,611	2,823	2,889	2,844
17. Specialties	179	199	194	216	214	189	187	188	193
18. Appliances	105	127	111	131	129	117	122	113	123
19. Plumbing	2,400	2,800	2,595	2,940	2,893	2,660	2,475	2,525	2,425
20. Heating	1,600	1,750	1,895	2,350	2,150	2,185	1,600	1,875	2,300
21. Electrical	1,615	1,965	2,125	2,424	2,169	2,475	2,250	2,415	2,350
22. Site Overhead	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300	3,300
TOTAL	$42,130	$46,606	$45,840	$52,561	$48,655	$47,416	$44,691	$45,086	$46,816

3.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 1 : Total Building Costs

ITEM	EDMONTON		CALGARY		RED DEER		FORT McMURRAY		GRANDE PRAIRIE		HINTON		LETHBRIDGE		MEDICINE HAT		LLOYDMINSTER	
ELEMENT	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%	TOTAL $	%
Labour	238,792	34.4	254,433	35.1	260,177	35.4	305,499	36.8	286,803	36.3	283,222	36.5	262,741	36.1	255,350	34.9	277,310	35.7
Material	454,724	65.6	470,068	64.9	473,862	64.6	525,402	63.2	504,352	63.7	493,300	63.5	465,953	63.9	476,078	65.1	500,148	64.3
Total 1987	693,517		724,502		734,041		830,902		791,155		776,523		728,692		731,429		777,454	
Cost per m2	$373.46		$390.15		$395.28		$447.44		$426.04		$418.16		$392.40		$393.88		$418.66	
Cost per SF	$34.70		$36.25		$36.72		$41.57		$39.58		$38.85		$36.46		$36.59		$38.89	
Total per Apt. 1987 $	$28,897		$30,188		$30,585		$34,621		$32,965		$32,355		$30,362		$30,476		$32,394	
Total 1986 $	648,534		647,135		665,963		778,075		742,644		731,043		679,312		676,195		730,802	
Total per Apt. 1986 $	27,022		26,964		27,748		32,420		30,944		30,460		28,305		28,175		30,450	
Changes From 1986	6.9%		12.0%		10.2%		6.8%		6.5%		6.2%		7.3%		8.2%		6.4%	

* Several total figures may appear as not added correctly. This is due to the rounding effect in the calculations of the detail costing for each centre.

2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 2 : Comparative Cost Ratios *

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
EDMONTON	1.00	1.04	1.06	1.20	1.14	1.12	1.05	1.05	1.12
CALGARY	0.96	1.00	1.01	1.15	1.09	1.07	1.01	1.01	1.07
RED DEER	0.94	0.99	1.00	1.13	1.08	1.06	0.99	1.00	1.06
FORT McMURRAY	0.83	0.87	0.88	1.00	0.95	0.93	0.88	0.88	0.94
GRANDE PRAIRIE	0.88	0.92	0.93	1.05	1.00	0.98	0.92	0.92	0.98
HINTON	0.89	0.93	0.95	1.07	1.02	1.00	0.94	0.94	1.00
LETHBRIDGE	0.95	0.99	1.01	1.14	1.09	1.07	1.00	1.00	1.07
MEDICINE HAT	0.95	0.99	1.00	1.14	1.08	1.06	1.00	1.00	1.06
LLOYD-MINSTER	0.89	0.93	0.94	1.07	1.02	1.00	0.94	0.94	1.00

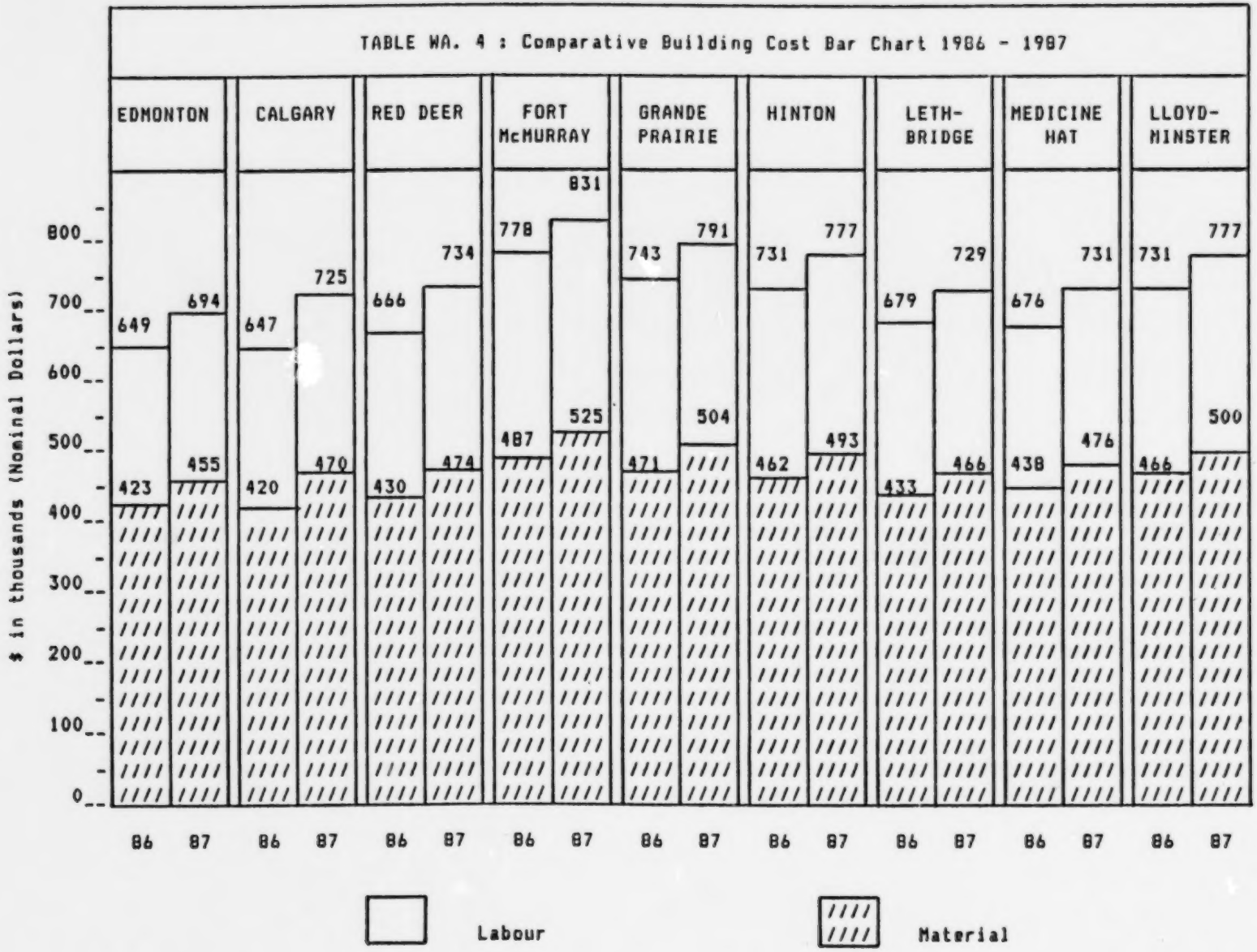
* Entries refer to the ratio of the price for a city in the top row of the table divided by a price for the city listed in the column. For example, Red Deer costs are 1.06 times Edmonton costs.

2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 3 : Comparative Cost Table 1986 - 1987

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Labour Cost									
1987	$238,792	$254,433	$260,177	$305,499	$286,803	$283,222	$262,741	$255,350	$277,310
1986	$225,545	$227,234	$236,381	$291,035	$271,867	$269,016	$246,730	$237,975	$264,811
Difference	$13,247	$27,199	$23,796	$14,464	$14,936	$14,206	$16,011	$17,375	$12,499
% Difference	5.9%	12.0%	10.1%	5.0%	5.5%	5.3%	6.5%	7.3%	4.7%
Mat'l Cost									
1987	$454,724	$470,068	$473,862	$525,402	$504,352	$493,300	$465,953	$476,078	$500,148
1986	$422,989	$419,901	$429,582	$487,040	$470,777	$462,027	$432,581	$438,220	$465,990
Difference	$31,735	$50,167	$44,280	$38,362	$33,575	$31,273	$33,372	$37,858	$34,158
% Difference	7.5%	11.9%	10.3%	7.9%	7.1%	6.8%	7.7%	8.6%	7.3%
Total Cost									
1987	$693,517	$724,502	$734,041	$830,902	$791,155	$776,523	$728,692	$731,429	$777,454
1986	$648,534	$647,135	$665,963	$778,075	$742,644	$731,043	$679,312	$676,195	$730,802
Difference	$44,983	$77,367	$68,078	$52,827	$48,511	$45,480	$49,380	$55,234	$46,652
% Difference	6.9%	12.0%	10.2%	6.8%	6.5%	6.2%	7.3%	8.2%	6.4%

2.0 SUMMARY OF FINDINGS FOR THE WALK - UP APARTMENT



2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 5 : Comparative Total Building Costs 1980 -1987 *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$709,337	$660,295	$670,183	$685,282	$811,898	$736,435	-	$703,808	$697,459	-
1981	$756,703	$714,492	$719,003	$733,211	$861,728	$784,409	-	$740,084	$743,992	-
1982	$712,232	$665,273	$627,844	$710,485	$805,134	$700,436	$744,686	$720,280	$723,716	-
1983	$644,459	$603,046	$592,174	$623,852	$712,262	$669,574	$674,046	$632,872	$647,845	-
1984	$658,084	$600,039	$591,861	$624,342	$731,995	$694,794	$693,688	$632,121	$652,014	$701,901
1985	$669,882	$625,974	$617,049	$644,466	$734,420	$695,480	$690,526	$651,143	$655,347	$714,537
1986	$699,967	$648,534	$647,135	$665,963	$778,075	$742,644	$731,043	$679,312	$676,195	$730,802
1987	$754,246	$693,517	$724,502	$734,041	$830,902	$791,155	$776,523	$728,692	$731,429	$777,454

Notes : * Expressed in nominal dollars
** Hinton was not included in the 1980 and 1981 studies
*** Lloydminster was not included in the 1980 through 1983 studies

2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE HA. 6 : Comparative Cost per Square Foot of Gross Floor Area 1980 -1987 *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$35.48	$33.04	$33.52	$34.28	$40.61	$36.84	-	$35.20	$34.89	-
1981	$37.86	$35.75	$35.97	$36.68	$43.11	$39.24	-	$37.03	$37.22	-
1982	$35.63	$33.28	$31.41	$35.54	$40.28	$35.04	$37.26	$36.03	$36.21	-
1983	$32.24	$30.17	$29.63	$31.21	$35.63	$33.50	$33.72	$31.66	$32.41	-
1984	$32.92	$30.02	$29.61	$31.23	$36.62	$34.76	$34.70	$31.62	$32.62	$35.11
1985	$33.51	$31.32	$30.87	$32.24	$36.74	$34.79	$34.55	$32.58	$32.79	$35.75
1986	$35.02	$32.44	$32.37	$33.32	$38.93	$37.15	$36.57	$33.98	$33.83	$36.56
1987	$37.73	$34.70	$36.25	$36.72	$41.57	$39.58	$38.85	$36.46	$36.59	$38.89

Notes : * Expressed in nominal dollars
** Hinton was not included in the 1980 and 1981 studies
*** Lloydminster was not included in the 1980 through 1983 studies

2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

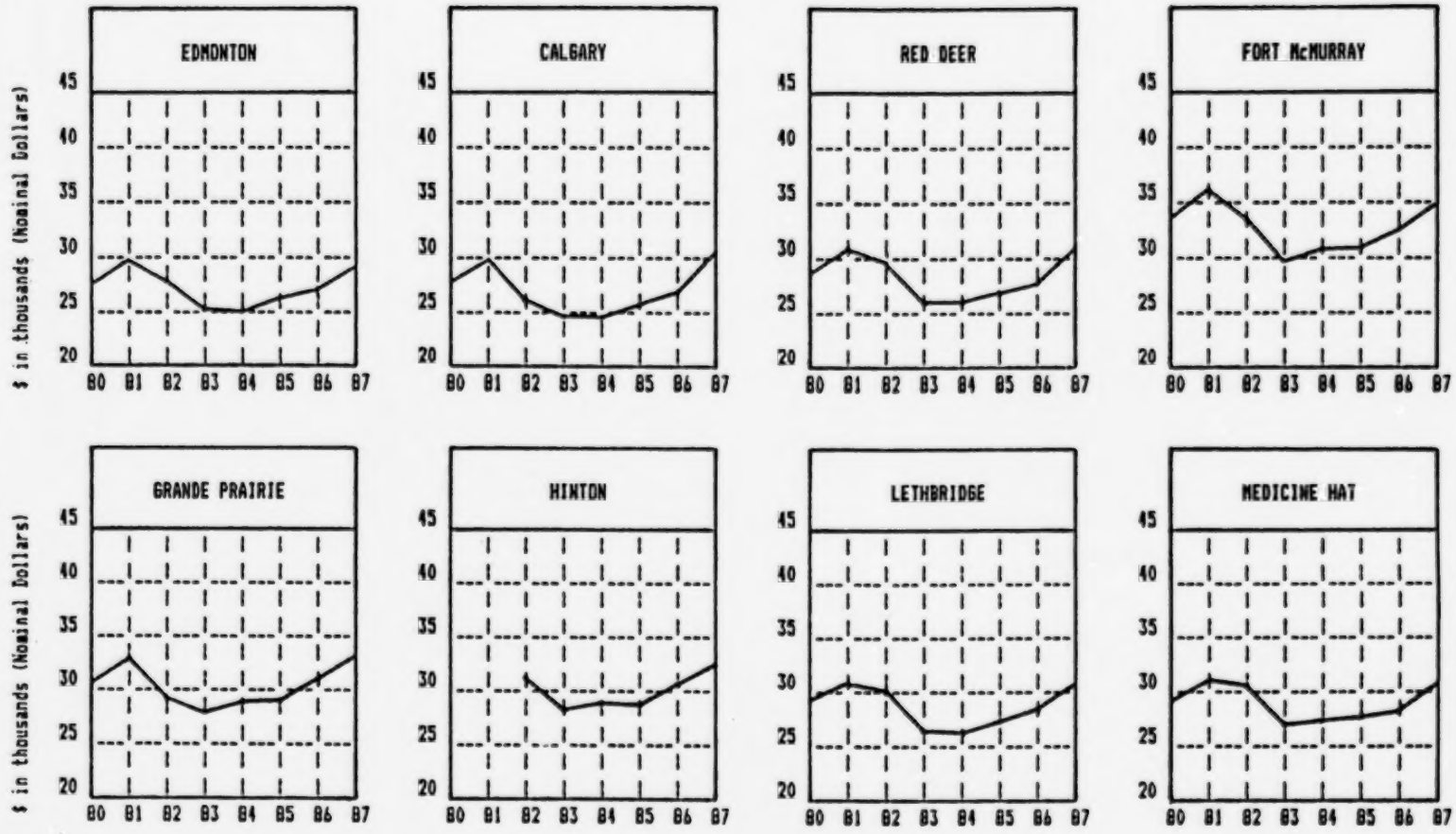
TABLE WA. 7 : Comparative Cost per Apartment Unit 1980 -1987 *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$29,555	$27,512	$27,924	$28,553	$33,829	$30,684	-	$29,325	$29,061	-
1981	$31,529	$29,771	$29,958	$30,550	$35,905	$32,684	-	$30,837	$31,000	-
1982	$29,677	$27,720	$26,160	$29,604	$33,547	$29,185	$31,029	$30,012	$30,155	-
1983	$26,853	$25,127	$24,674	$25,994	$29,678	$27,899	$28,085	$26,370	$26,994	-
1984	$27,420	$25,002	$24,661	$26,014	$30,500	$28,950	$28,904	$26,338	$27,167	$29,246
1985	$27,912	$26,082	$25,710	$26,853	$30,601	$28,978	$28,772	$27,131	$27,306	$29,772
1986	$29,165	$27,022	$26,964	$27,748	$32,420	$30,944	$30,460	$28,305	$28,175	$30,450
1987	$31,427	$28,897	$30,188	$30,585	$34,621	$32,965	$32,355	$30,362	$30,476	$32,394

Notes : * Expressed in nominal dollars
** Hinton was not included in the 1980 and 1981 studies
*** Lloydminster was not included in the 1980 through 1983 studies

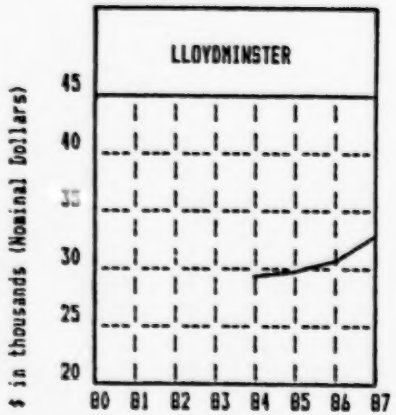
2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. B : Comparative Apartment Unit Cost Graphs 1980 -1987



2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. B : Comparative Apartment Unit Cost Graphs 1980 -1987 (Continued)



2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 9 : Comparative Cost per Apartment Unit 1980 -1987 (Inflation Adjusted Dollars) *

YEAR	AVERAGE	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	** HINTON	LETHBRIDGE	MEDICINE HAT	*** LLOYD-MINSTER
1980	$44,244	$41,185	$41,802	$42,744	$50,642	$45,934	-	$43,900	$43,504	-
1981	$41,713	$39,387	$39,634	$40,418	$47,502	$43,241	-	$40,797	$41,013	-
1982	$35,523	$33,181	$31,314	$35,436	$40,156	$34,934	$37,142	$35,924	$36,096	-
1983	$30,531	$28,569	$28,054	$29,555	$33,744	$31,721	$31,933	$29,983	$30,692	-
1984	$30,436	$27,752	$27,374	$28,876	$33,855	$32,135	$32,083	$29,235	$30,155	$32,463
1985	$30,145	$28,169	$27,767	$29,001	$33,049	$31,296	$31,074	$29,301	$29,490	$32,154
1986	$30,303	$28,076	$28,016	$28,830	$33,684	$32,151	$31,648	$29,409	$29,274	$31,638
1987	$31,427	$28,897	$30,188	$30,585	$34,621	$32,965	$32,355	$30,362	$30,476	$32,394

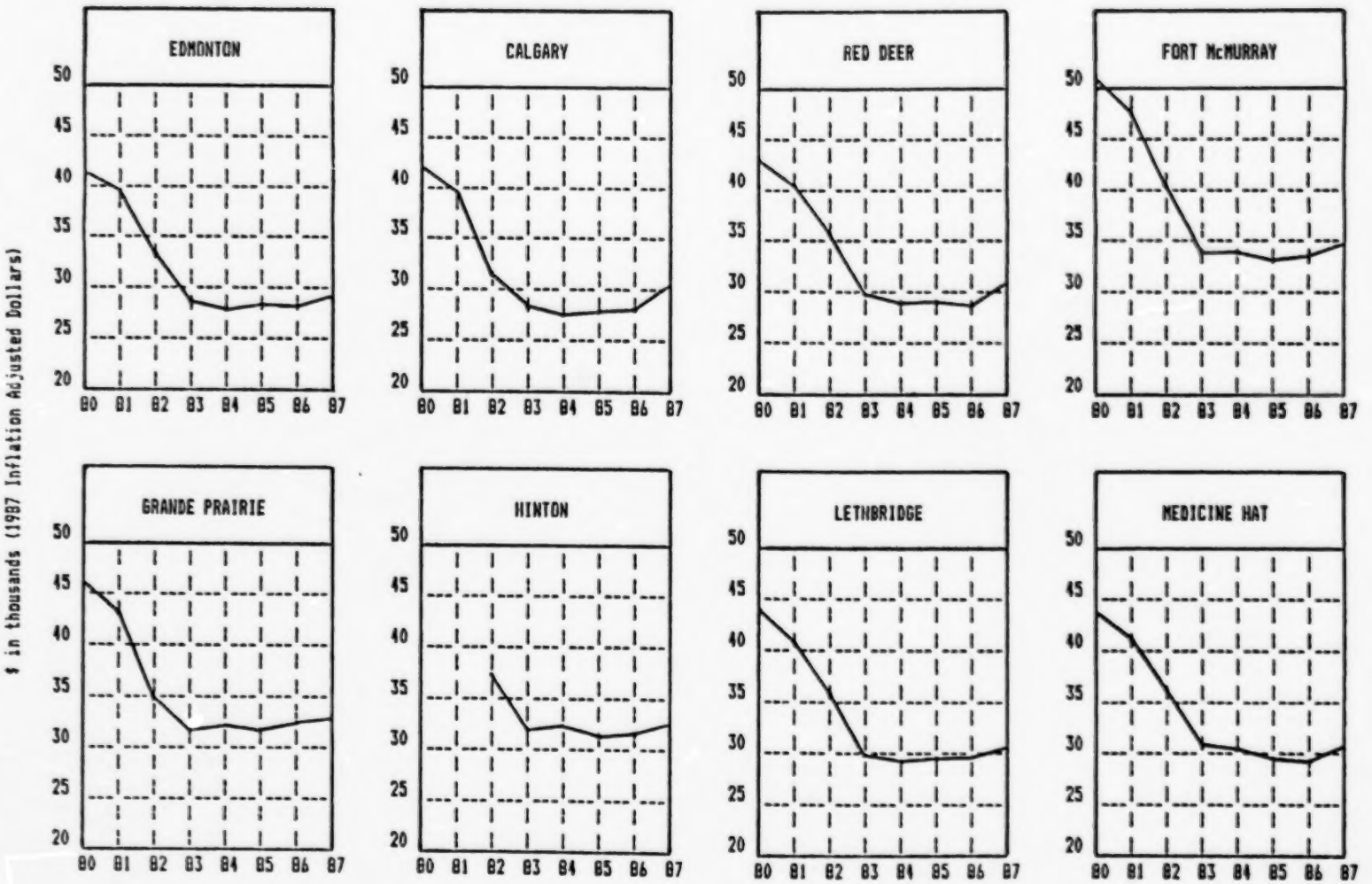
Notes : * 1. Expressed in 1987 Inflation adjusted dollars
2. Inflation adjustments have been based on the Consumer Price Index for Edmonton and Calgary

** Hinton was not included in the 1980 and 1981 studies

*** Lloydminster was not included in the 1980 through 1983 studies

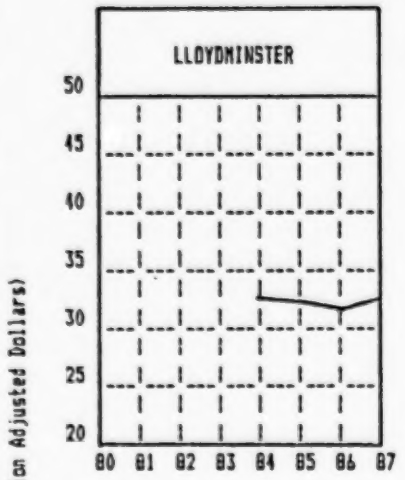
2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 10 : Comparative Apartment Unit Cost Graphs 1980 -1987 (Inflation Adjusted Dollars)



2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE NA. 10 : Comparative Apartment Unit Cost Graphs 1980 -1987 (Inflation Adjusted Dollars)



2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 11 : Trade Division Cost Summaries

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Divisions									
1. Excavation	2,545	4,188	3,391	3,968	3,360	2,805	3,593	3,065	3,631
2. Concrete	18,461	18,747	19,029	24,658	22,848	23,384	18,077	19,940	19,970
3. Damproofing	696	890	923	1,231	1,124	918	926	876	883
4. Siding	14,264	14,368	14,743	18,993	18,143	17,778	16,772	16,624	18,397
5. Roofing	24,385	25,611	26,104	33,586	27,496	26,939	25,188	25,732	28,633
6. Rough Carpentry	130,071	136,077	133,476	156,934	147,050	139,120	141,069	127,712	131,109
7. Finish Carpentry	9,012	9,502	9,833	10,587	9,949	9,304	9,377	9,587	9,412
8. Windows and Glazing	24,750	23,914	26,403	30,740	26,802	26,486	26,136	26,626	26,513
9. Sealants	827	888	850	912	877	860	817	853	877
10. Doors	39,494	38,551	40,133	42,149	43,142	42,906	40,843	39,554	43,055
11. Hardware	3,355	3,787	3,618	3,740	3,580	3,521	3,415	3,517	3,500
12. Ceramic Tiling	5,201	5,396	5,396	6,535	6,275	5,903	6,035	6,273	7,449
SUB - TOTAL	$273,061	$281,919	$283,899	$334,033	$310,646	$299,924	$292,248	$280,359	$293,429

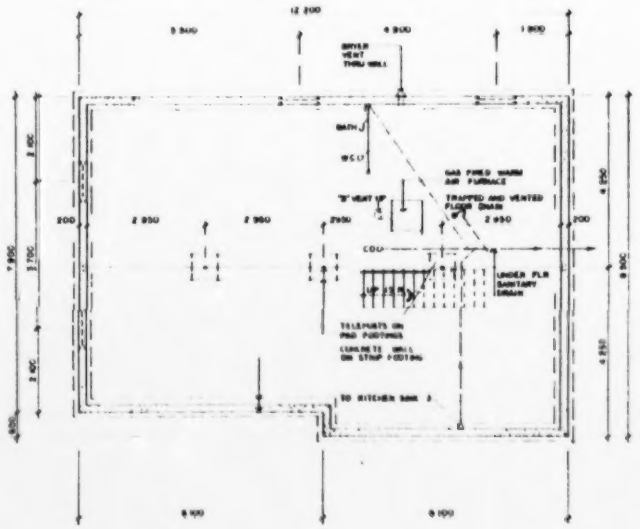
2.0 SUMMARY OF FINDINGS FOR THE WALK-UP APARTMENT

TABLE WA. 11 : Trade Division Cost Summaries (cont'd)

LOCATION	EDMONTON	CALGARY	RED DEER	FORT McMURRAY	GRANDE PRAIRIE	HINTON	LETHBRIDGE	MEDICINE HAT	LLOYD-MINSTER
Divisions									
13. Wallboard	54,182	56,871	56,122	67,245	59,484	62,763	55,258	57,326	64,390
14. Flooring	44,880	46,903	48,598	53,459	48,797	48,060	47,337	48,251	49,172
15. Painting	19,244	18,961	21,394	23,484	21,926	22,593	22,493	23,558	22,859
16. Fitting	44,130	45,128	44,280	51,653	48,253	44,785	48,767	49,384	49,495
17. Specialties	16,336	16,932	16,828	18,824	18,190	17,462	16,691	17,111	17,430
18. Appliances	29,916	29,916	29,936	31,628	31,963	30,900	30,770	30,448	30,703
19. Plumbing	60,552	62,520	62,016	69,000	71,904	65,592	60,768	62,544	60,240
20. Heating	29,616	33,192	36,240	43,080	41,208	39,072	27,240	31,152	43,968
21. Ventilation	7,368	7,680	7,488	9,432	9,120	9,204	8,328	8,400	9,216
22. Fire Protection	2,040	2,040	2,040	2,616	2,592	2,592	2,040	2,040	2,616
23. Electrical	37,992	43,320	47,880	51,048	53,520	59,880	42,552	47,184	60,384
24. Site Overhead	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000	49,000
Subtotals - 1-24	$668,317	$694,382	$705,721	$804,502	$766,603	$751,827	$703,492	$706,757	$752,902
25. Gnrl. Contr's Ovhd.& Profit	25,200	30,120	28,320	26,400	24,552	24,696	25,200	24,672	24,552
TOTAL	$693,517	$724,502	$734,041	$830,902	$791,155	$776,523	$728,692	$731,429	$777,454

APPENDIX A

Reduced Drawings : Single-Detached Dwelling



BASEMENT / FOUNDATION PLAN

NOTE SEE BUILDING SECTIONS FOR NOTES ON CONSTRUCTION ASSEMBLIES AND SIZES

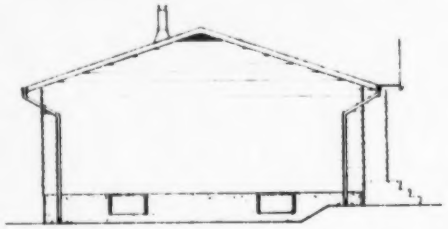
GROUND FLOOR PLAN

● SMOKE ALARM SHALL BE INSTALLED BY A PERMANENT CONNECTION TO AN ELECTRICAL CIRCUIT

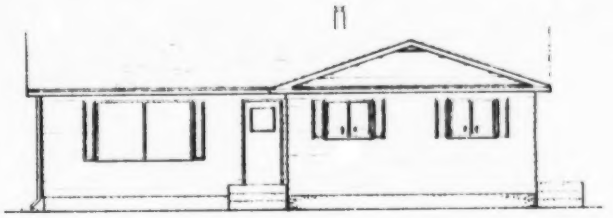
ALBERTA HOUSE COST COMPARISON STUDY

FLOOR PLANS

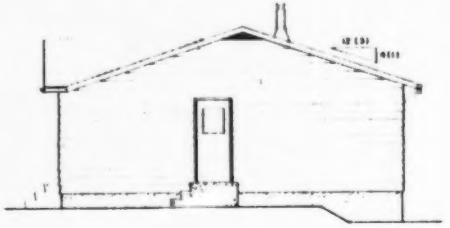
SCALE 1:50



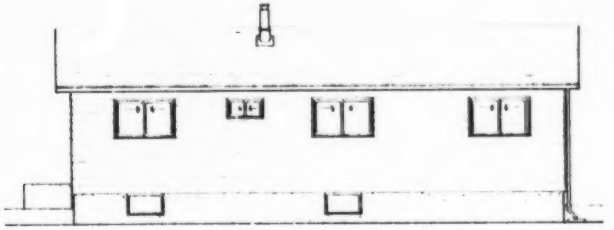
LEFT ELEVATION



FRONT ELEVATION



RIGHT ELEVATION

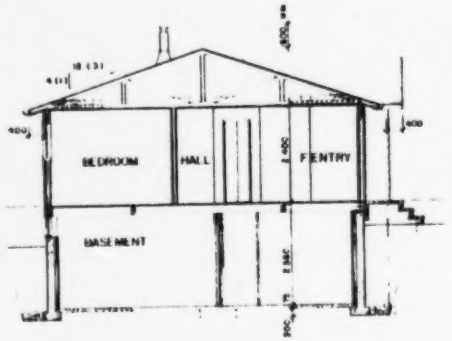


REAR ELEVATION

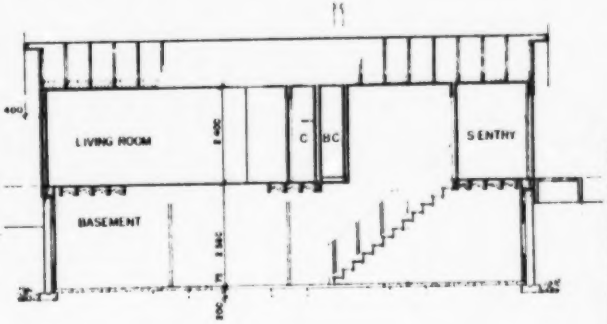
ALBERTA HOUSE COST COMPARISON STUDY

ELEVATIONS

SCALE 1:50



SECTION A



SECTION B

EXTERIOR WALL:

INTERIOR WALL:

FLOOR:

ROOF:

STAIRS:

MECHANICAL NOTES:

NOTES:

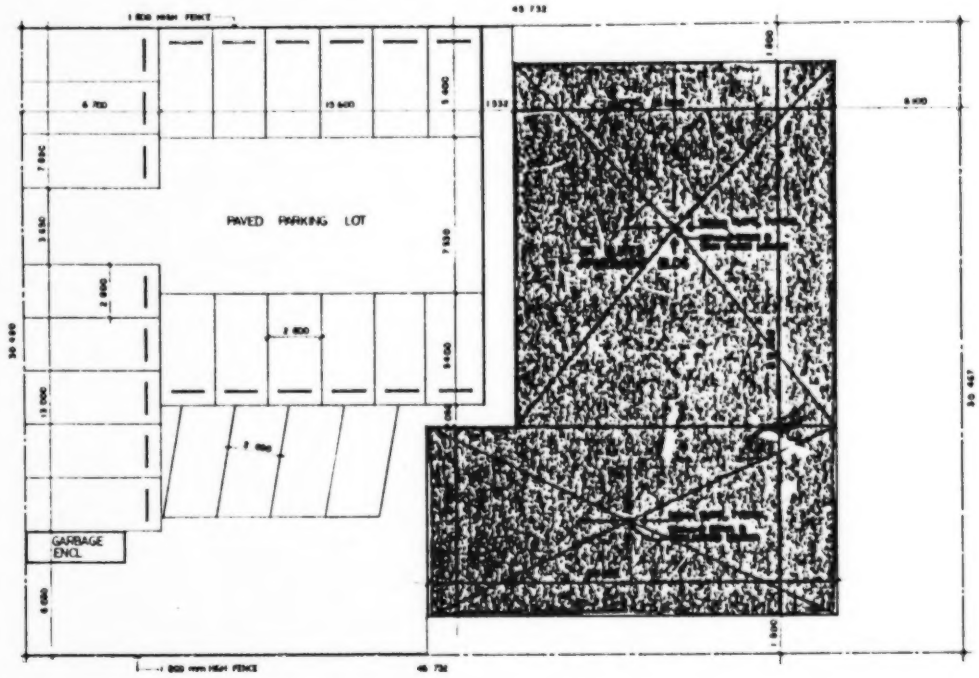
ALBERTA HOUSE COST COMPARISON STUDY

SECTIONS

SCALE 1:50

APPENDIX B

Reduced Drawings : Walk-Up Apartment



STATISTICS

SITE AREA 1394m²

SUITES 2x ONE BEDROOM

BUILDING

AREA 465m²

PARKING 2x CARS

THE BUILDING IS REQUIRED TO FACE AT LEAST ONE STREET

ACCESS WALL PANELS OR WINDOW SHALL BE PROVIDED ON SECOND AND THIRD FLOOR IN AT LEAST 1 WALL FACING ON A STREET

SPACIAL SEPARATIONS BETWEEN BUILDINGS:

THE MAXIMUM PERCENTAGE OF UNPROTECTED OPENINGS IN AN EXPOSED BUILDING FACE SHALL CONFORM TO THE REQUIREMENTS OUTLINED IN THE ALBERTA BUILDING CODE 4.5.10.3(1)

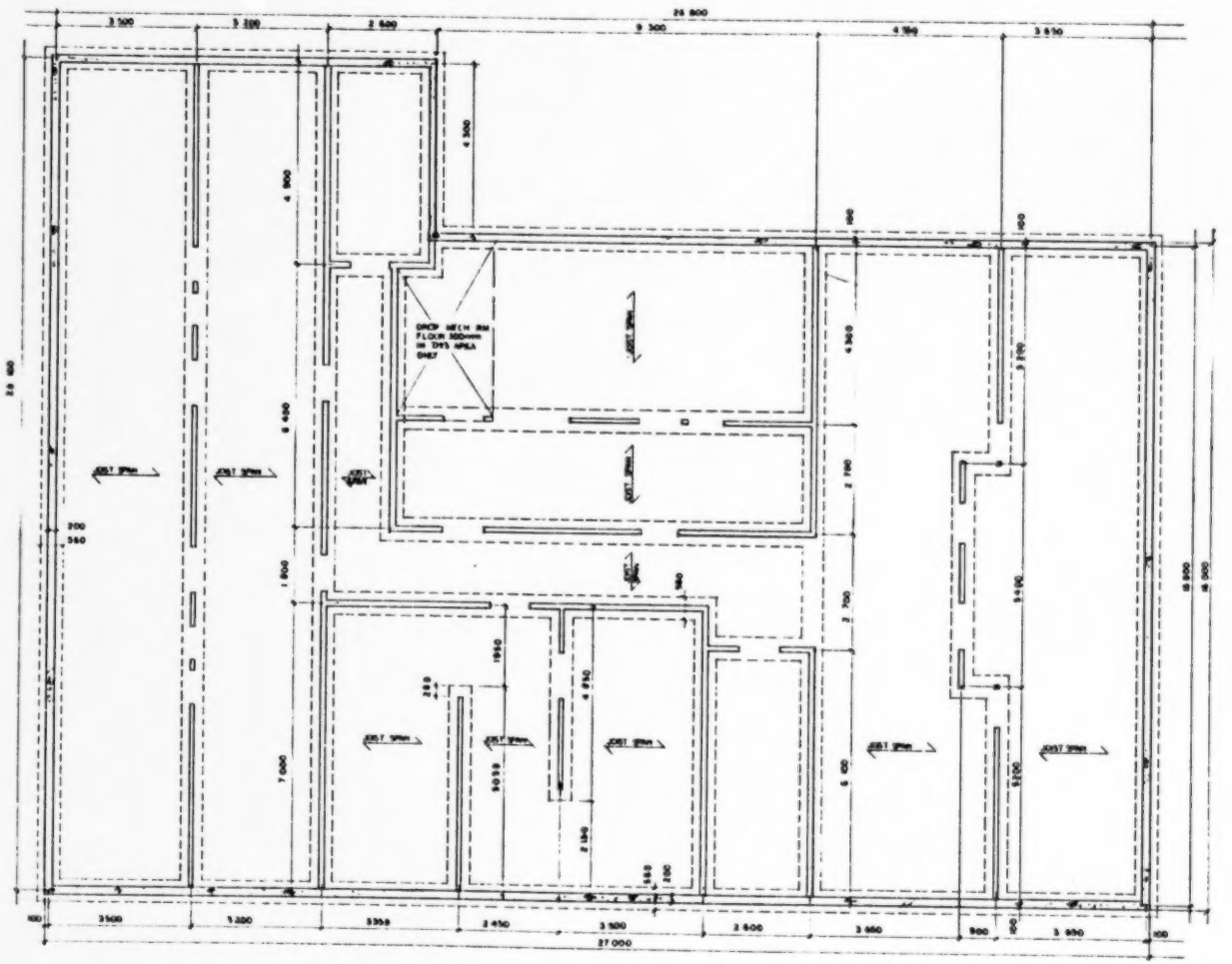
ONE SET OF EXAMINED DRAWINGS SHALL BE AVAILABLE CONTINUOUSLY AT THE CONSTRUCTION SITE DURING WORKING HOURS FOR INSPECTION BY THE AUTHORITY HAVING JURISDICTION

ALBERTA HOUSE COST COMPARISON STUDY

SITE PLAN

SCALE 1:100

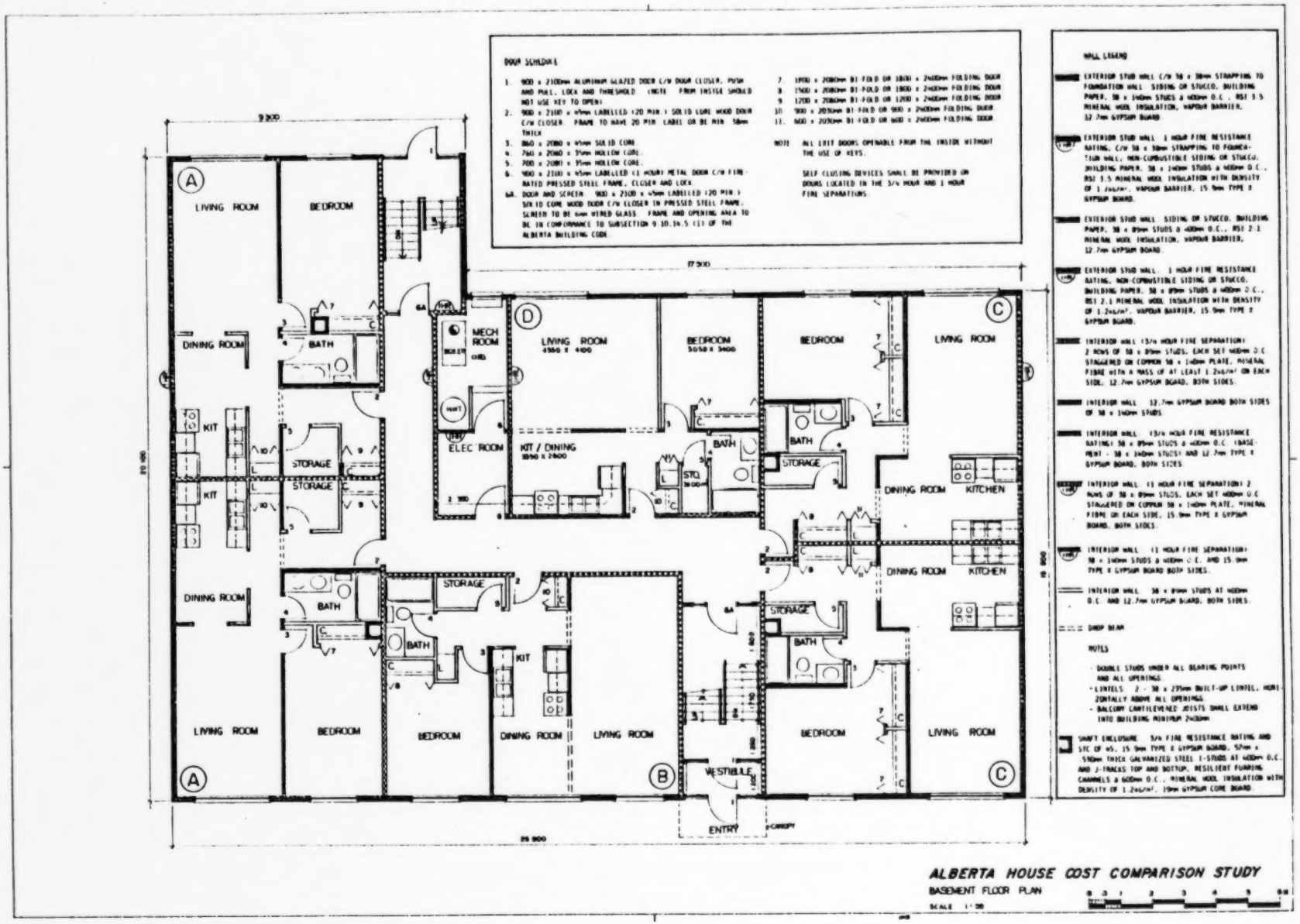
0 1 2 3 4 5 6 7 8 9 10m



ALBERTA HOUSE COST COMPARISON STUDY

FOUNDATION PLAN

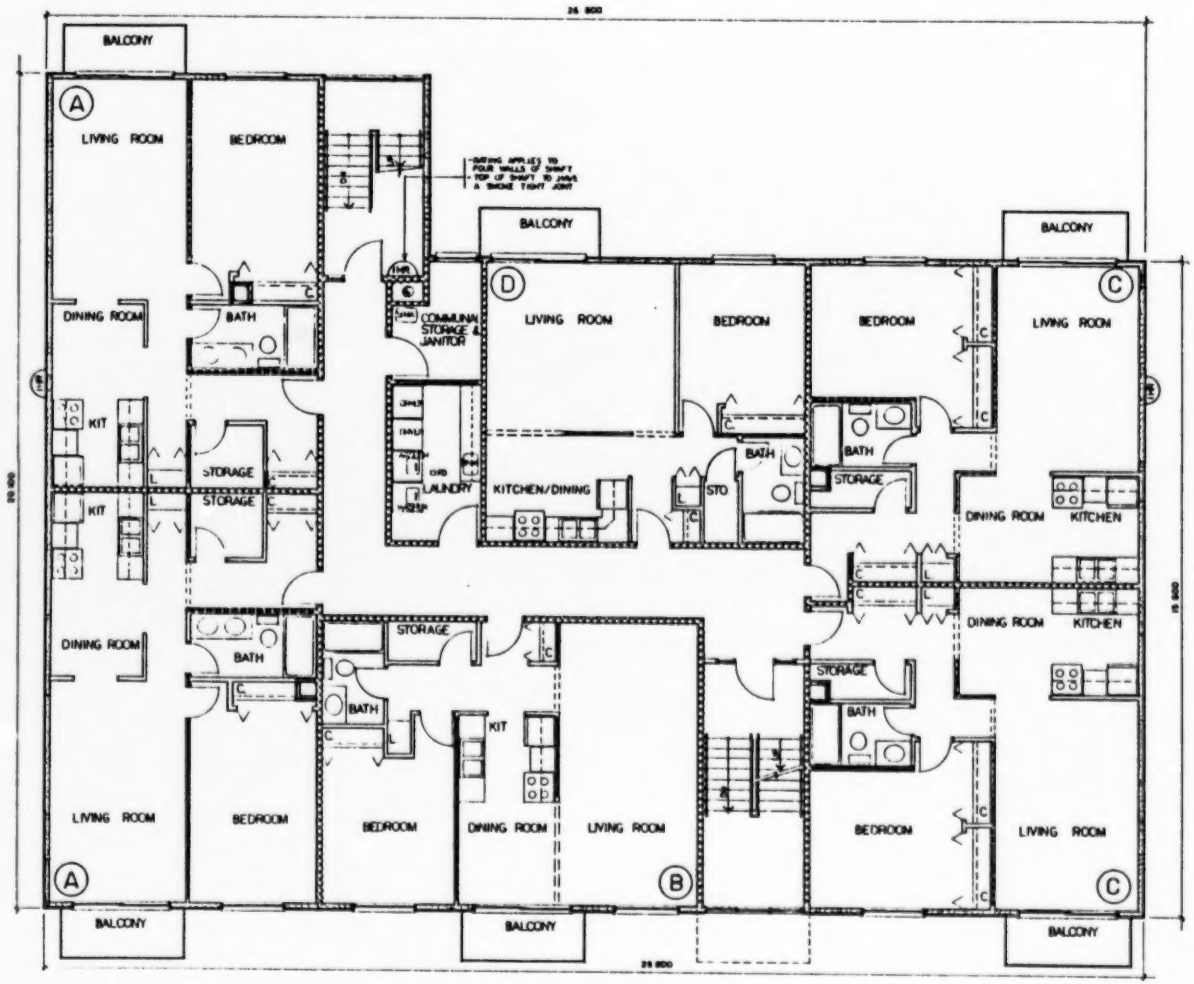
SCALE 1:50


DOOR SCHEDULE
1. 900 x 2100mm ALUMINUM GLAZED DOOR C/W DOOR CLOSER, PUSH AND PULL, LOCK AND THRESHOLD (NOTE - FROM INSIDE SHOULD NOT USE KEY TO OPEN)
2. 900 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER - FRAME TO HAVE 20 MIN. LABEL OR BE MIN. 58mm THICK
3. 860 x 2080 x 45mm SOLID CORE
4. 760 x 2080 x 35mm HOLLOW CORE.
5. 700 x 2080 x 35mm HOLLOW CORE.
6. 900 x 2100 x 45mm LABELLED (1 HOUR) METAL DOOR C/W FIRE-RATED PRESSED STEEL FRAME, CLOSER AND LOCK
6A. DOOR AND SCREEN - 900 x 2100 x 45mm LABELLED (20 MIN.) SOLID CORE WOOD DOOR C/W CLOSER IN PRESSED STEEL FRAME. SCREEN TO BE 6mm WIRED GLASS - FRAME AND OPENING AREA TO BE IN CONFORMANCE TO SUBSECTION 9.10.14.5 (1) OF THE ALBERTA BUILDING CODE
7. 1950 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR
8. 1760 x 2080mm BI-FOLD OR 1800 x 2400mm FOLDING DOOR
9. 1200 x 2080mm BI-FOLD OR 1200 x 2400mm FOLDING DOOR
10. 900 x 2030mm BI-FOLD OR 900 x 2400mm FOLDING DOOR
11. 600 x 2030mm BI-FOLD OR 600 x 2400mm FOLDING DOOR
NOTE: ALL EXIT DOORS OPENABLE FROM THE INSIDE WITHOUT THE USE OF KEYS.
SELF CLOSING DEVICES SHALL BE PROVIDED ON DOORS LOCATED IN THE 3/4 HOUR AND 1 HOUR FIRE SEPARATIONS.
WALL LEGEND
EXTERIOR STUD WALL C/W 38 x 38mm STRAPPING TO FOUNDATION WALL SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 3.5 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD
(1HR) EXTERIOR STUD WALL 1 HOUR FIRE RESISTANCE RATING, C/W 38 x 38mm STRAPPING TO FOUNDATION WALL, NON-COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 140mm STUDS @ 400mm O.C., RSI 3.5 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.
EXTERIOR STUD WALL SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION, VAPOUR BARRIER, 12.7mm GYPSUM BOARD.
(1HR) EXTERIOR STUD WALL 1 HOUR FIRE RESISTANCE RATING, NON COMBUSTIBLE SIDING OR STUCCO, BUILDING PAPER, 38 x 89mm STUDS @ 400mm O.C., RSI 2.1 MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, VAPOUR BARRIER, 15.9mm TYPE X GYPSUM BOARD.
INTERIOR WALL (3/4 HOUR FIRE SEPARATION) 2 ROWS OF 38 x 89mm STUDS, EACH SET @ 400mm O.C. STAGGERED ON COPPER 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kg/m² ON EACH SIDE, 12.7mm GYPSUM BOARD, BOTH SIDES.
INTERIOR WALL 12.7mm GYPSUM BOARD BOTH SIDES OF 38 x 140mm STUDS
INTERIOR WALL 3/4 HOUR FIRE RESISTANCE RATING: 38 x 89mm STUDS @ 400mm O.C. (BASEMENT - 38 x 140mm STUDS) AND 12.7mm TYPE X GYPSUM BOARD, BOTH SIDES
(1HR) INTERIOR WALL (1 HOUR FIRE SEPARATION) 2 ROWS OF 38 x 89mm STUDS, EACH SET @ 400mm O.C. STAGGERED ON COPPER 38 x 140mm PLATE, MINERAL FIBRE ON EACH SIDE, 15.9mm TYPE X GYPSUM BOARD, BOTH SIDES.
(1HR) INTERIOR WALL (1 HOUR FIRE SEPARATION) 38 x 140mm STUDS @ 400mm O.C. AND 15.9mm TYPE X GYPSUM BOARD BOTH SIDES.
INTERIOR WALL 38 x 89mm STUDS AT 400mm O.C. AND 12.7mm GYPSUM BOARD, BOTH SIDES.
DROP BEAM
NOTES
- DOUBLE STUDS UNDER ALL BEARING POINTS AND ALL OPENINGS
- LINTELS 2 - 38 x 235mm BUILT-UP LINTEL, HORIZONTALLY ABOVE ALL OPENINGS
- BALCONY CANTILEVERED JOISTS SHALL EXTEND INTO BUILDING MINIMUM 2x10mm
SHAFT ENCLOSURE 3/4 FIRE RESISTANCE RATING AND STC OF 45, 15.9mm TYPE X GYPSUM BOARD, 92mm x 590mm THICK GALVANIZED STEEL I-STUDS AT 400mm O.C. AND J-TRACKS TOP AND BOTTOM, RESILIENT FURRING CHANNELS @ 600mm O.C., MINERAL WOOL INSULATION WITH DENSITY OF 1.2kg/m³, 19mm GYPSUM CORE BOARD
9300
17300
15900
A
B
C
D
LIVING ROOM
BEDROOM
DINING ROOM
BATH
KIT
KITCHEN
STORAGE
MECH ROOM
ELEC ROOM
KIT / DINING
3050 x 2600
LIVING ROOM 4550 x 4100
BEDROOM 3650 x 3400
STO.
VESTIBULE
ENTRY
CANOPY

ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN

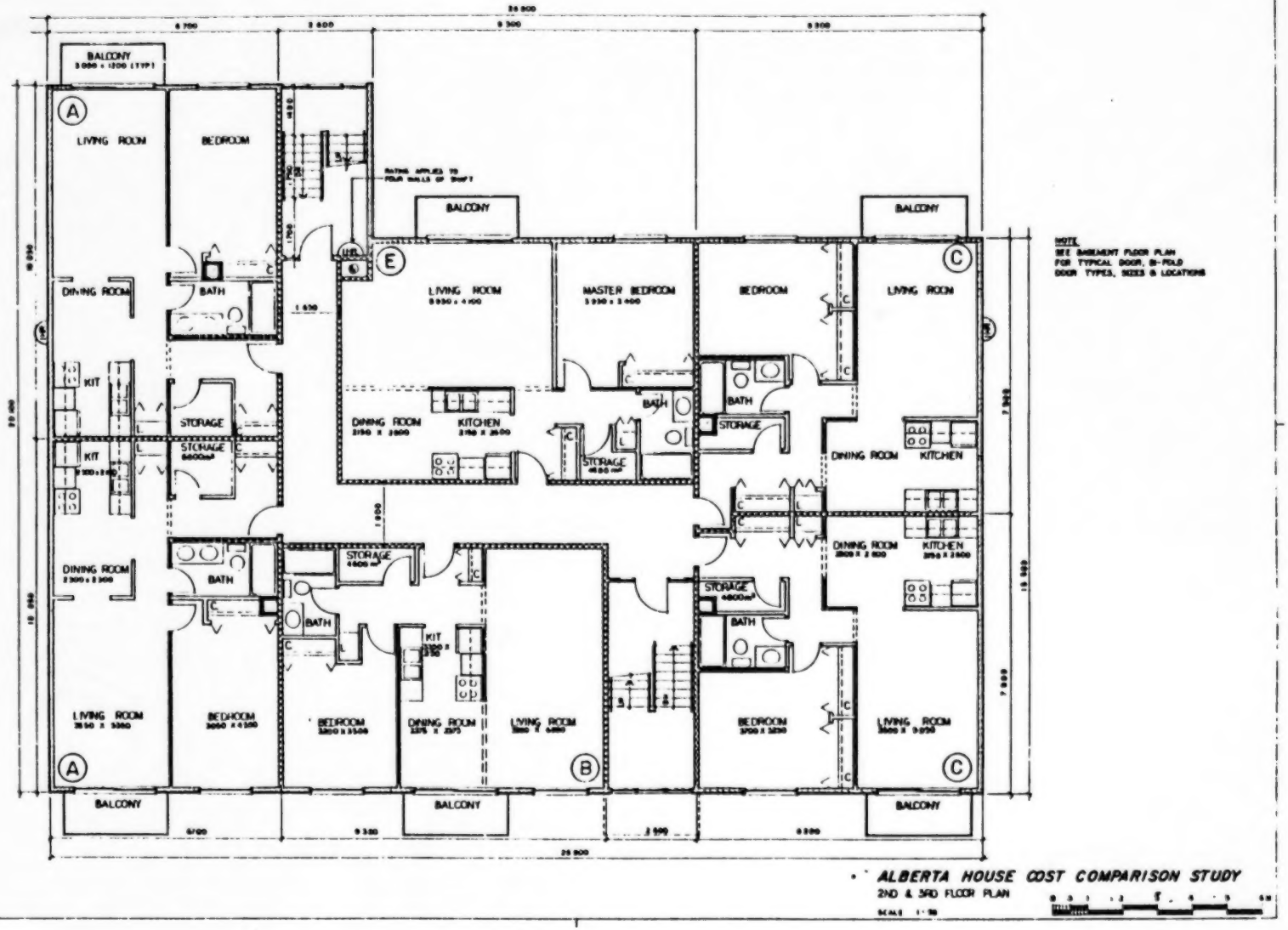
SCALE 1:50



ALBERTA HOUSE COST COMPARISON STUDY

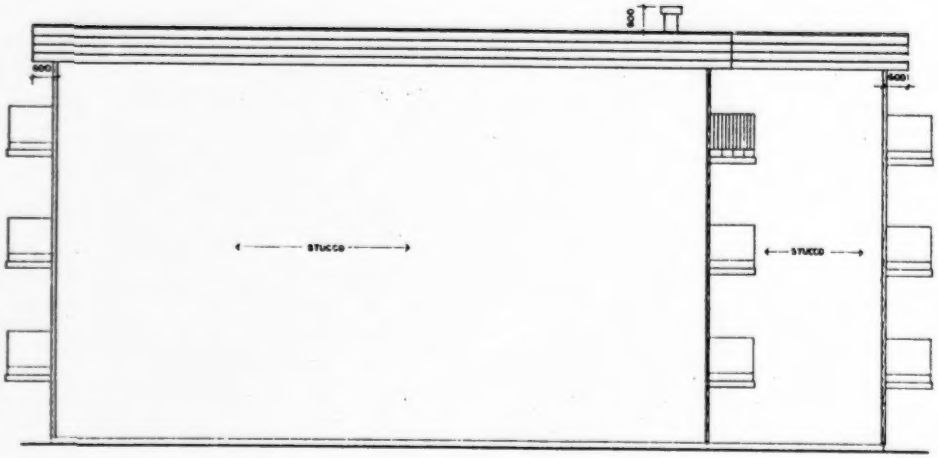
MAIN FLOOR PLAN

SCALE 1:50


BALCONY
LIVING ROOM
BEDROOM
DINING ROOM
BATH
KIT
STORAGE
KITCHEN
MASTER BEDROOM
NOTE
SEE BASEMENT FLOOR PLAN
FOR TYPICAL DOOR, BI-FOLD
DOOR TYPES, SIZES & LOCATIONS
ALBERTA HOUSE COST COMPARISON STUDY
2ND & 3RD FLOOR PLAN

METAL CHIMNEY
G.I. FLASHING PAINTED TO MATCH FASCIA
METAL FASCIA PAINTED WHITE
BALCONY GUARD: 1070mm HIGH; 970mm HIGH METAL PICKETS AT 100mm O.C.; RAILING SECURED TO BALCONY DECK AT 1200mm O.C. MAX.
STAINED DARK BROWN CEDAR COLUMN
STUCCO
CANOPY
PARGING

FRONT ELEVATION



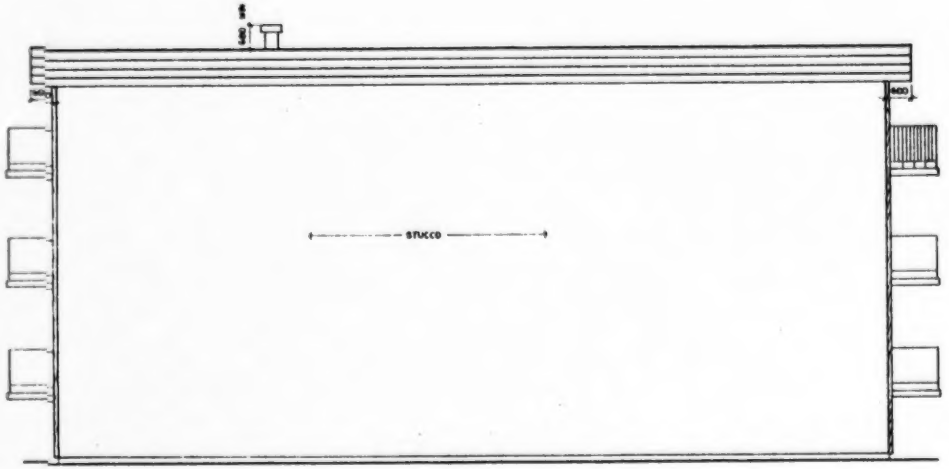
RIGHT ELEVATION

ALBERTA HOUSE COST COMPARISON STUDY

ELEVATIONS

SCALE 1:50

REAR ELEVATION



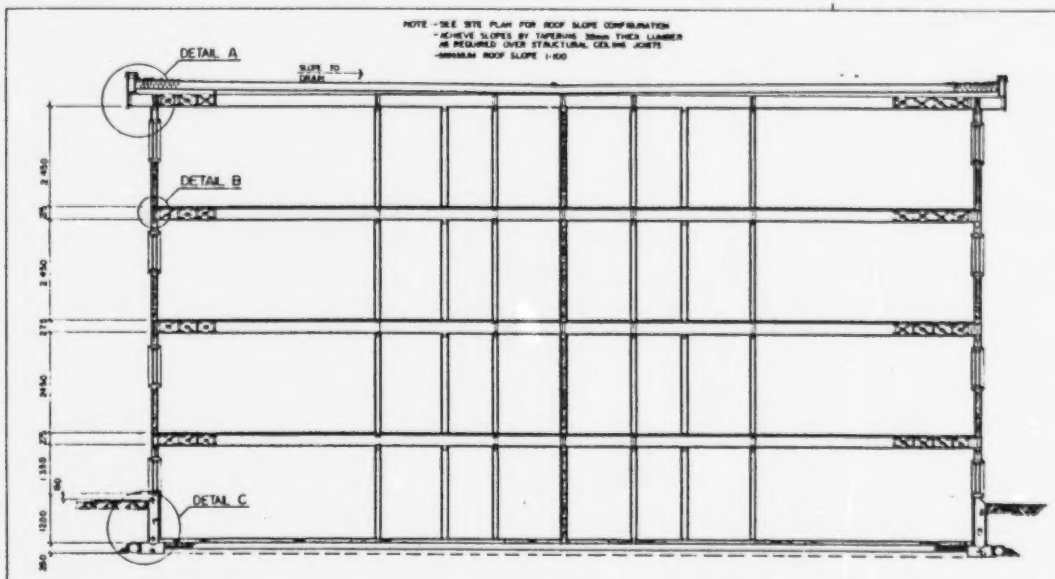
LEFT ELEVATION

DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR ARCHITECT REGISTERED IN THE PROVINCE OF ALBERTA.

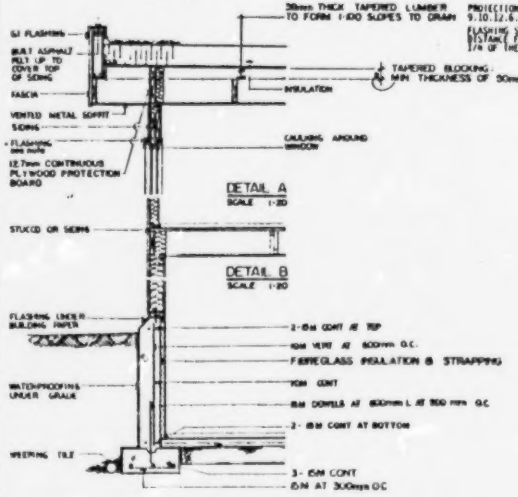
ALBERTA HOUSE COST COMPARISON STUDY

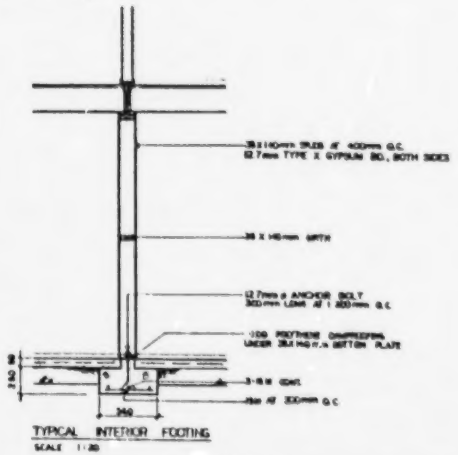
ELEVATIONS

SCALE 1:50



SECTION
SCALE 1:50


38mm THICK TAPERED LUMBER TO FORM 1:100 SLOPES TO DRAIN
PROJECTION OF SOFFITS SHALL BE PROVIDED AS STATED IN ARTICLES 9.10.12.6. OR 9.10.12.7.
FLASHING SHALL BE APPLIED OVER ALL EXTERIOR OPENINGS WHERE THE VERTICAL DISTANCE FROM THE BOTTOM OF THE EAVE TO THE TOP OF THE TRIM IS MORE THAN 1/4 OF THE HORIZONTAL OVERHANG OF THE EAVE.
GI FLASHING
BUILT ASPHALT ROLL UP TO COVER TOP OF SIDING
FASCIA
TAPERED BLOCKING
MIN THICKNESS OF 50mm
INSULATION
VENTED METAL SOFFIT
SIDING
FLASHING
12.7mm CONTINUOUS PLYWOOD PROTECTION BOARD
CAULKING AROUND WINDOW
DETAIL A
SCALE 1:20
STUCCO OR SIDING
DETAIL B
SCALE 1:20
FLASHING UNDER BUILDING PAPER
WATERPROOFING UNDER GRADE
WEEPING TILE
2-15M CONT AT TOP
10M VENT AT 600mm O.C.
FIBREGLASS INSULATION & STRAPPING
10M CONT
15M DOWELS AT 600mm L AT 1500 mm O.C.
2-15M CONT AT BOTTOM
3-15M CONT
15M AT 300mm OC
DETAIL C
SCALE 1:20


38 x 140mm STUDS AT 400mm O.C.
12.7mm TYPE X GYPSUM BD., BOTH SIDES
38 X 140mm SMTH
12.7mm ø ANCHOR BOLT 300mm LONG AT 1.800mm O.C.
100 POLYTHENE DAMPPROOFING UNDER 38X140 m.m. BOTTOM PLATE
3-15M CONT.
15M AT 300mm O.C.
350
250

TYPICAL INTERIOR FOOTING
SCALE 1:20

ROOF CONSTRUCTION - 1 HOUR FIRE RESISTANCE RATING

- ROOFING GRAVEL
- BUILT-UP ROOFING
- RSI 6 RIGID FIBREGLASS INSULATION AND VAPOUR BARRIER
- 10mm PLYWOOD SHEATHING. ALL EDGES SUPPORTED WITH MIN. 38 x 38mm WOOD BLOCKING
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 38mm CROSS-BRIDGING
- 15.9mm TYPE X GYPSUM BOARD

NOTE
ALTERNATE INSULATION RSI 6.7 FIBREGLASS BATT INSULATION SET IN JOIST SPACE

EXTERIOR WALL CONSTRUCTION

TYPE A: NO FIRE RESISTANCE RATING

- SIDING OR STUCCO
- BUILDING PAPER
- RSI 2.1 MINERAL WOOL INSULATION AND VAPOUR BARRIER
- 38 x 89mm WOOD STUDS @ 400mm O.C. (38 x 140mm WOOD STUDS @ 400mm O.C. FOR BASEMENT)
- 12.7mm GYPSUM BOARD

TYPE B: 1 HOUR FIRE RESISTANCE RATING

- SAME AS TYPE A EXCEPT MINERAL WOOL INSULATION TO HAVE DENSITY OF 1.2kG/m³; 15.9mm TYPE X GYPSUM BOARD AND STUCCO OR NON-COMBUSTIBLE SIDING

FLOOR CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- FLOOR FINISH
- 8mm PLYWOOD UNDERLAY
- 19mm T & G LUMBER OR 15.9mm PLYWOOD OR WAFERBOARD SUBFLOOR WITH MINERAL FIBRE BETWEEN JOISTS SPACED 400mm O.C.
- 38 x 235mm NO. 1 SPRUCE JOISTS AT 400mm O.C.
- 38 x 38mm CROSS-BRIDGING AT 2.1m O.C. MAX.
- RESILIENT CHANNELS
- 15.9mm TYPE X GYPSUM BOARD TYPICALLY EXCEPT FOR MECHANICAL ROOM CEILING: APPLY 2 LAYERS OF 15.9mm TYPE X GYPSUM BOARD

CORRIDOR AND DEMISING WALL CONSTRUCTION

- 3/4 HOUR FIRE SEPARATION AND S.T.C. RATING OF 45
- TWO ROWS 38 x 89mm STUDS, EACH SET 400mm O.C. STAGGERED ON COMMON 38 x 140mm PLATE, MINERAL FIBRE WITH A MASS OF AT LEAST 1.2kG/m² ON EACH SIDE
- 12.7mm GYPSUM BOARD, BOTH SIDES.

BEARING WALL CONSTRUCTION

- 3/4 HOUR FIRE RESISTANCE RATING
- 38 x 140mm OR 38 x 89mm WOOD STUDS @ 400mm O.C.
- 12.7mm TYPE X GYPSUM WALLBOARD, BOTH SIDES

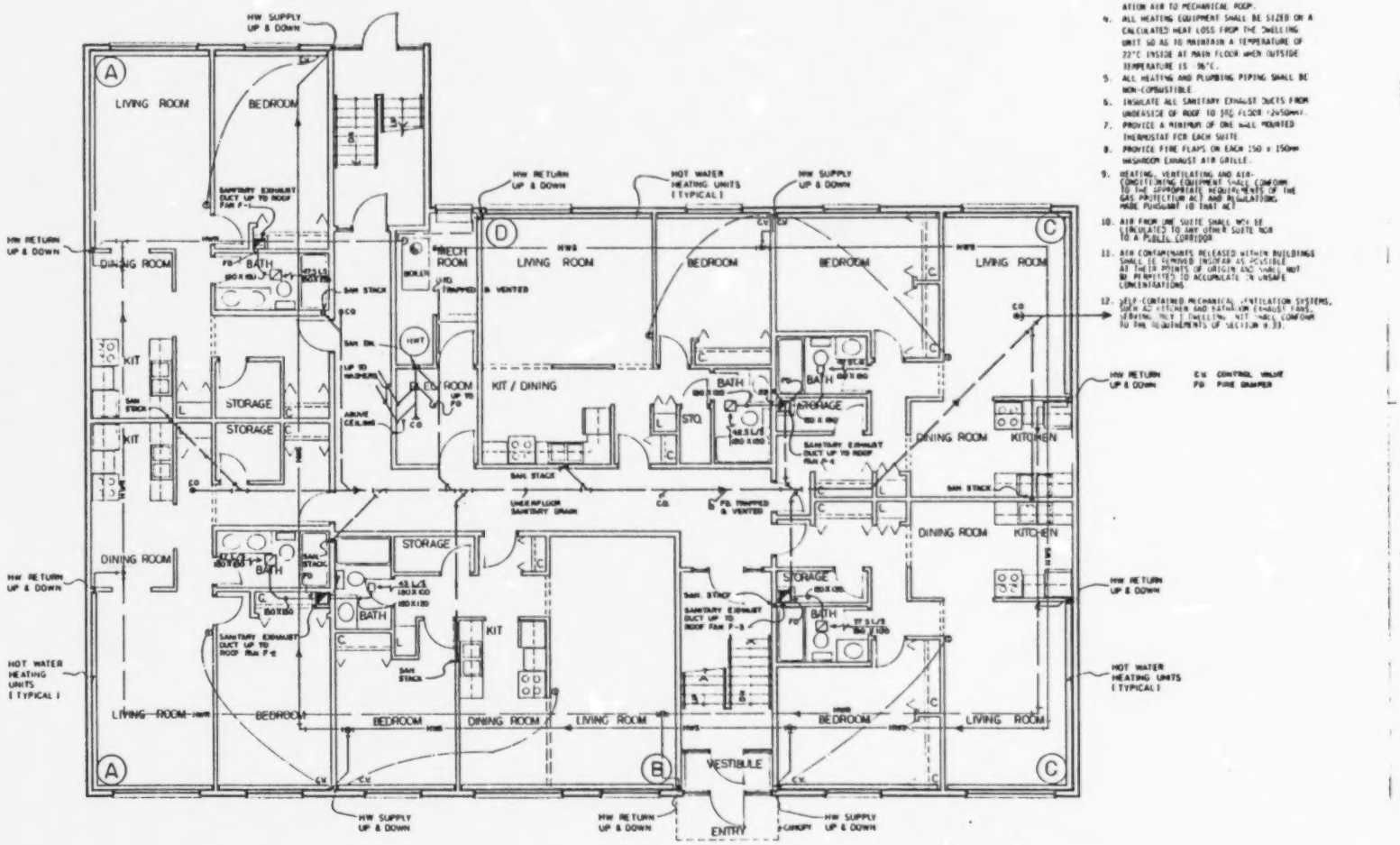
NOTES

1. PROVIDE GALVANIZED STEEL, GA. .45/mm AT THE HEAD OF ALL EXTERIOR OPENINGS.
2. WEEPING TILES SHALL BE LAID ON UNDISTURBED OR WELL-COMPACTED SOIL SO THAT THE TOP OF THE WEEPING TILE IS BELOW THE UNDERSIDE OF THE FLOOR SLAB.
3. ROOF TRUSSES SHALL BE DESIGNED IN CONFORMANCE WITH PART 4 AND FOR THE APPROPRIATE GROUND SNOW LOADS STATED IN TABLE 2.1.1.B. (STANDATA 85-01 ONLY)

ALBERTA HOUSE COST COMPARISON STUDY

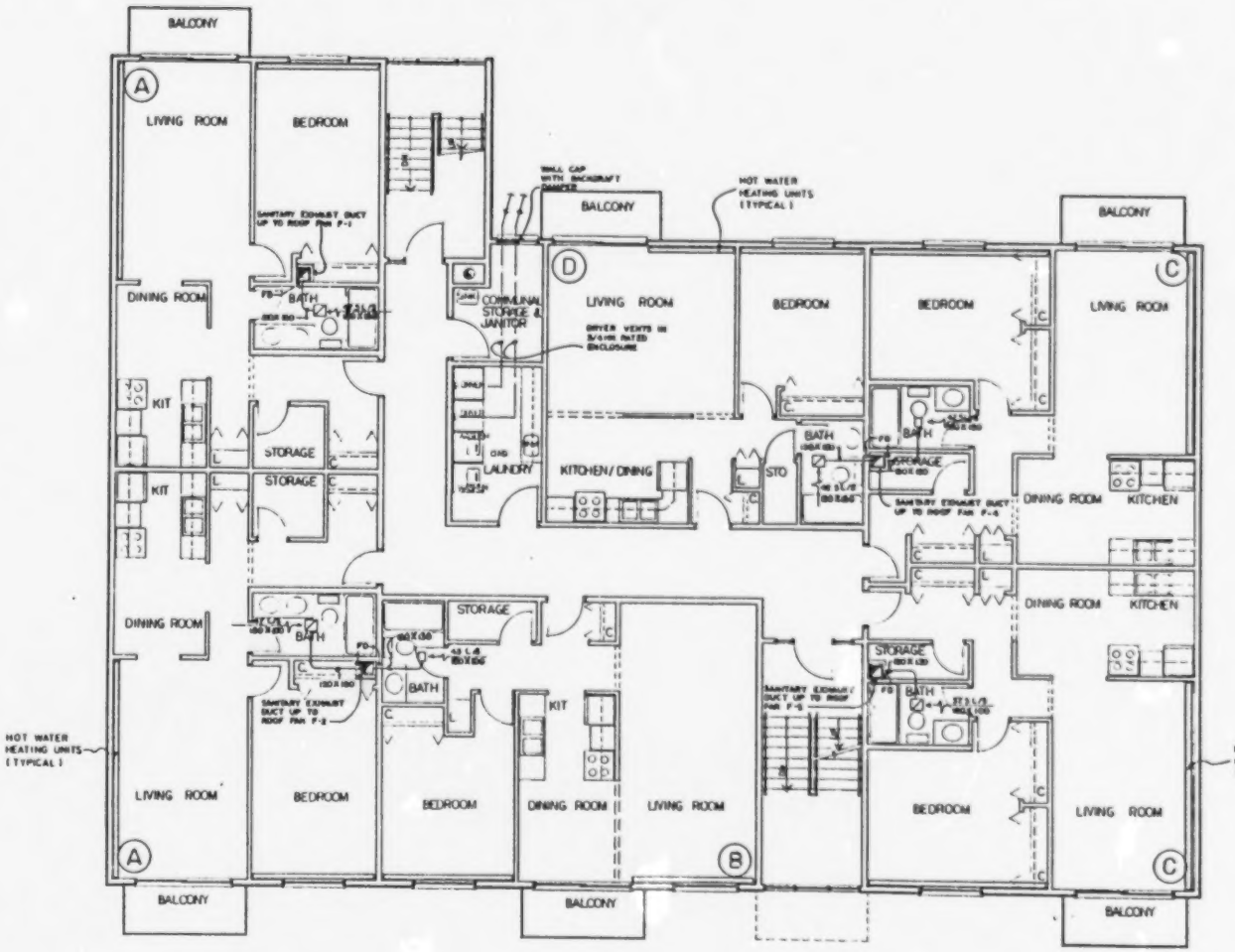
SECTION & DETAILS

SCALES : AS SHOWN


MECHANICAL NOTES
1. GAS FIRED HOT WATER HEATING BOILER SHALL BE INSTALLED IN ACCORDANCE WITH "THE GAS PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THE ACT"
2. PROVIDE TYPE "B" CHIMNEY FOR BOILER.
3. PROVIDE ADEQUATE COMBUSTION AND VENTILATION AIR TO MECHANICAL ROOM.
4. ALL HEATING EQUIPMENT SHALL BE SIZED ON A CALCULATED HEAT LOSS FROM THE DWELLING UNIT SO AS TO MAINTAIN A TEMPERATURE OF 22°C INSIDE AT MAIN FLOOR WHEN OUTSIDE TEMPERATURE IS -36°C.
5. ALL HEATING AND PLUMBING PIPING SHALL BE NON-COMBUSTIBLE
6. INSULATE ALL SANITARY EXHAUST DUCTS FROM UNDERSIDE OF ROOF TO 3RD FLOOR (2450mm).
7. PROVIDE A MINIMUM OF ONE WALL MOUNTED THERMOSTAT FOR EACH SUITE
8. PROVIDE FIRE FLAPS ON EACH 150 x 150mm MUSHROOM EXHAUST AIR GRILLE.
9. HEATING, VENTILATING AND AIR-CONDITIONING EQUIPMENT SHALL CONFORM TO THE APPROPRIATE REQUIREMENTS OF THE GAS PROTECTION ACT AND REGULATIONS MADE PURSUANT TO THAT ACT.
10. AIR FROM ONE SUITE SHALL NOT BE CIRCULATED TO ANY OTHER SUITE NOR TO A PUBLIC CORRIDOR
11. AIR CONTAMINANTS RELEASED WITHIN BUILDINGS SHALL BE REMOVED INDOOR AS POSSIBLE AT THEIR POINTS OF ORIGIN AND SHALL NOT BE PERMITTED TO ACCUMULATE IN UNSAFE CONCENTRATIONS
12. SELF-CONTAINED MECHANICAL VENTILATION SYSTEMS, SUCH AS KITCHEN AND BATHROOM EXHAUST FANS, SERVING MULTI DWELLING UNIT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 9.33.
C.V. CONTROL VALVE
F.D. FIRE DAMPER
HW SUPPLY UP & DOWN
HW RETURN UP & DOWN
HOT WATER HEATING UNITS (TYPICAL)
LIVING ROOM
BEDROOM
DINING ROOM
KIT / DINING
KIT
KITCHEN
BATH
STORAGE
STO.
MECH. ROOM
ELEC. ROOM
VESTIBULE
ENTRY
SAN STACK
SANITARY EXHAUST DUCT UP TO ROOF FAN F-1
SANITARY EXHAUST DUCT UP TO ROOF FAN F-2
SANITARY EXHAUST DUCT UP TO ROOF FAN F-3
SANITARY EXHAUST DUCT UP TO ROOF FAN F-4
UNDERFLOOR SANITARY DRAIN
F.D. TRAPPED & VENTED
A
B
C
D

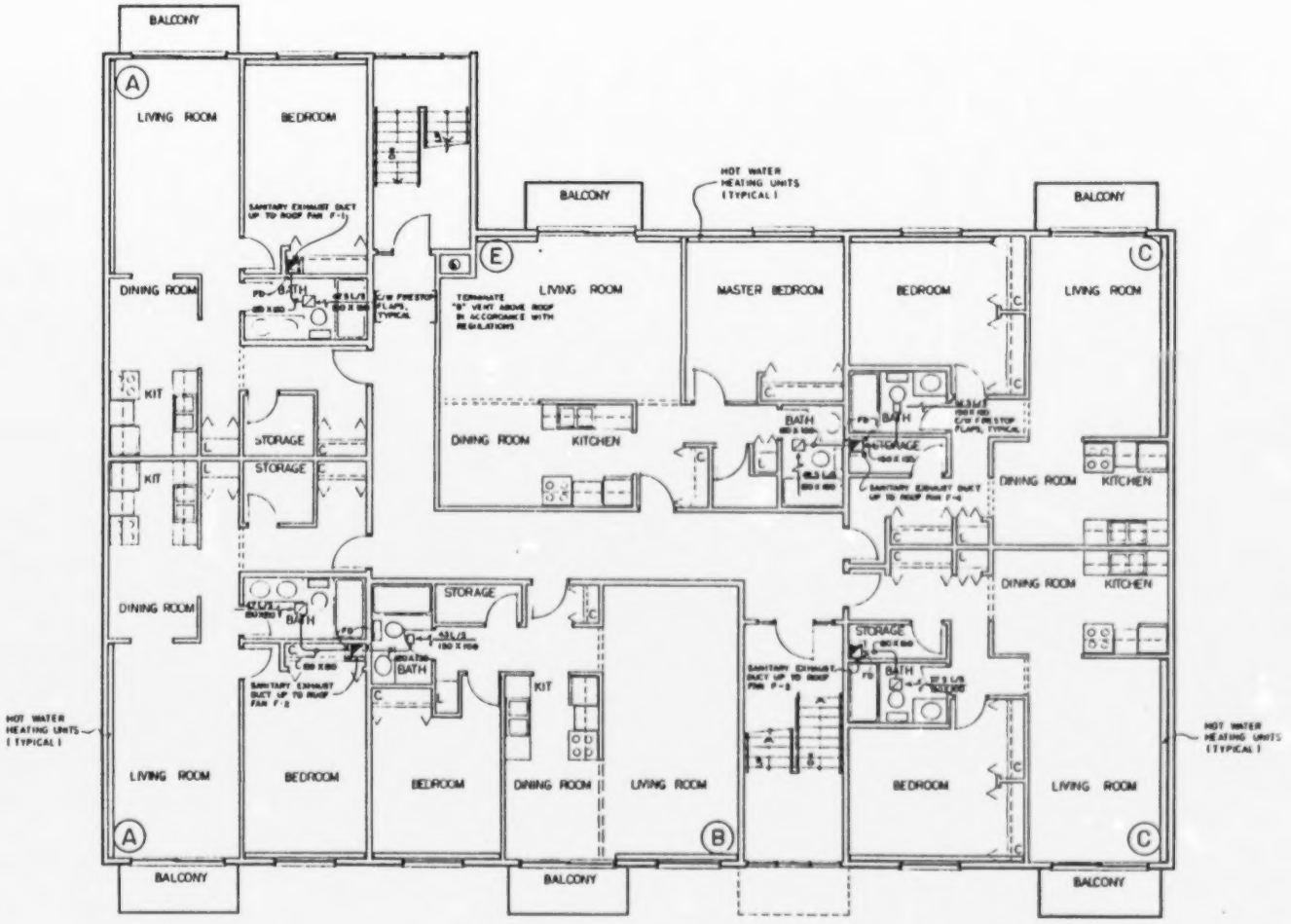
ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1:50



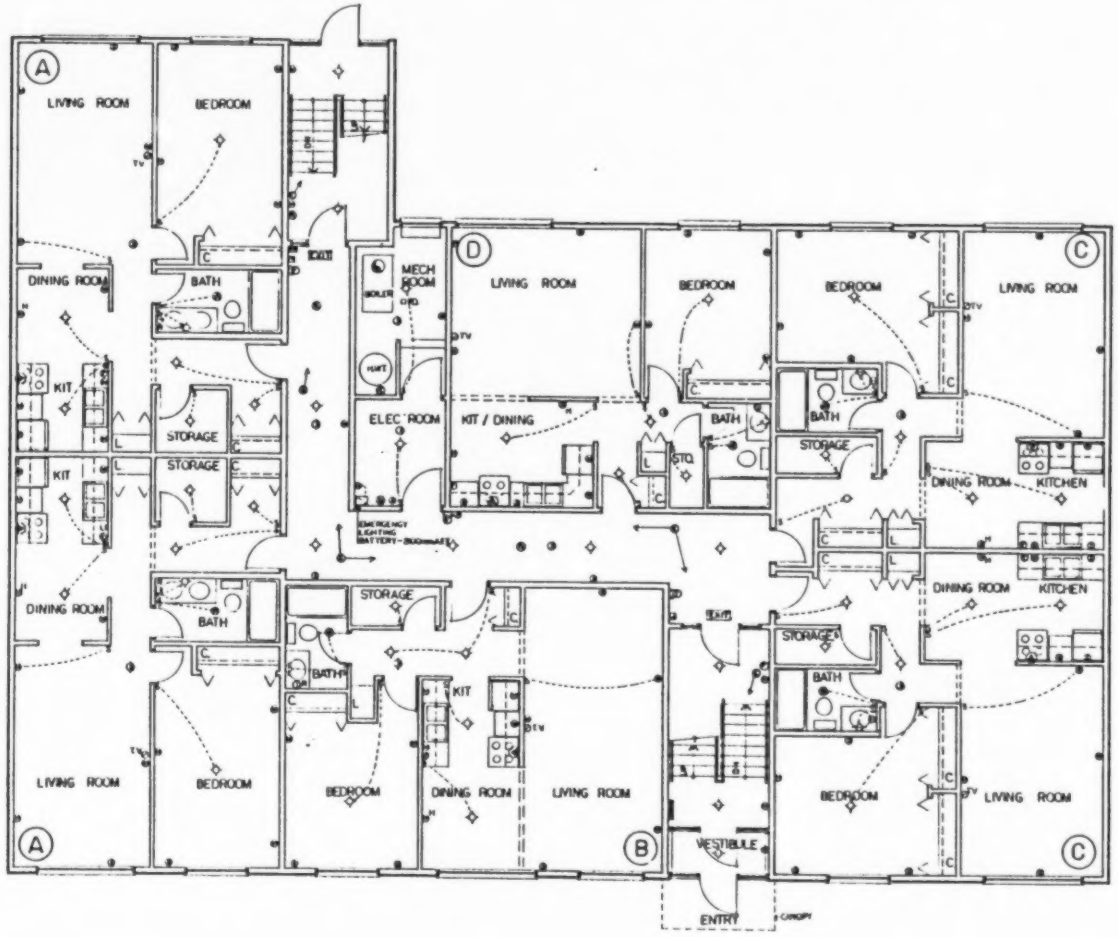
ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1" = 8'



ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN
MECHANICAL LAYOUT
SCALE 1:75

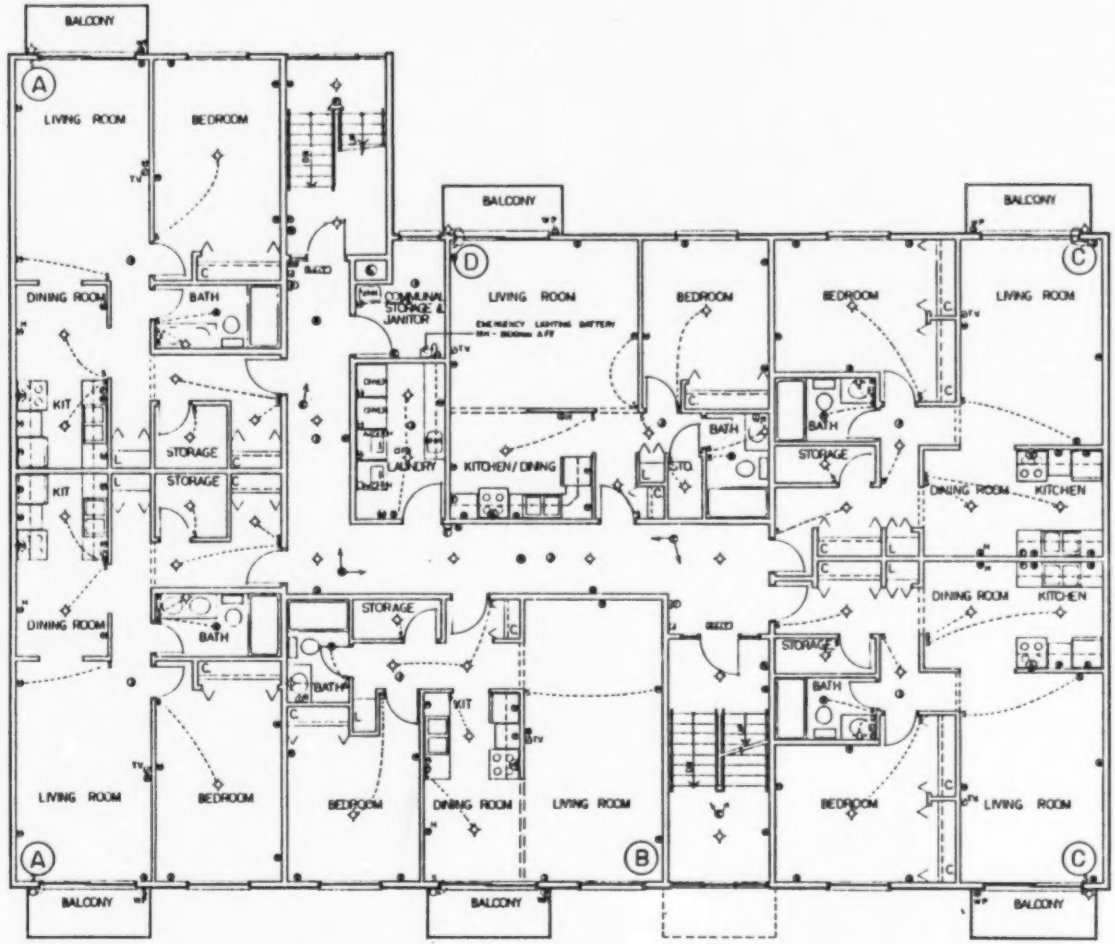


ELECTRICAL LEGEND

- EXIT LIGHTS with 2-25w - 120V AND 1-12V-15w EMERGENCY POWER SUPPLY
- EMERGENCY LIGHTING HEAD, 12V-12V
- EMERGENCY LIGHTING, 2 HEADS, 12V-12V
- SMOKE ALARM
- MANUAL FIRE ALARM STATION
- FIRE ALARM BELL, 25mm DIAMETER
- END-OF-LINE RESISTOR
- MASTER FIRE ALARM PANEL C/W ANNUNCIATOR AND GEL CELL BATTERY AND 120V POWER SUPPLY AND AUTOMATIC CHARGER. 1 ZONE PER FLOOR, 2 ZONES - STAIRS

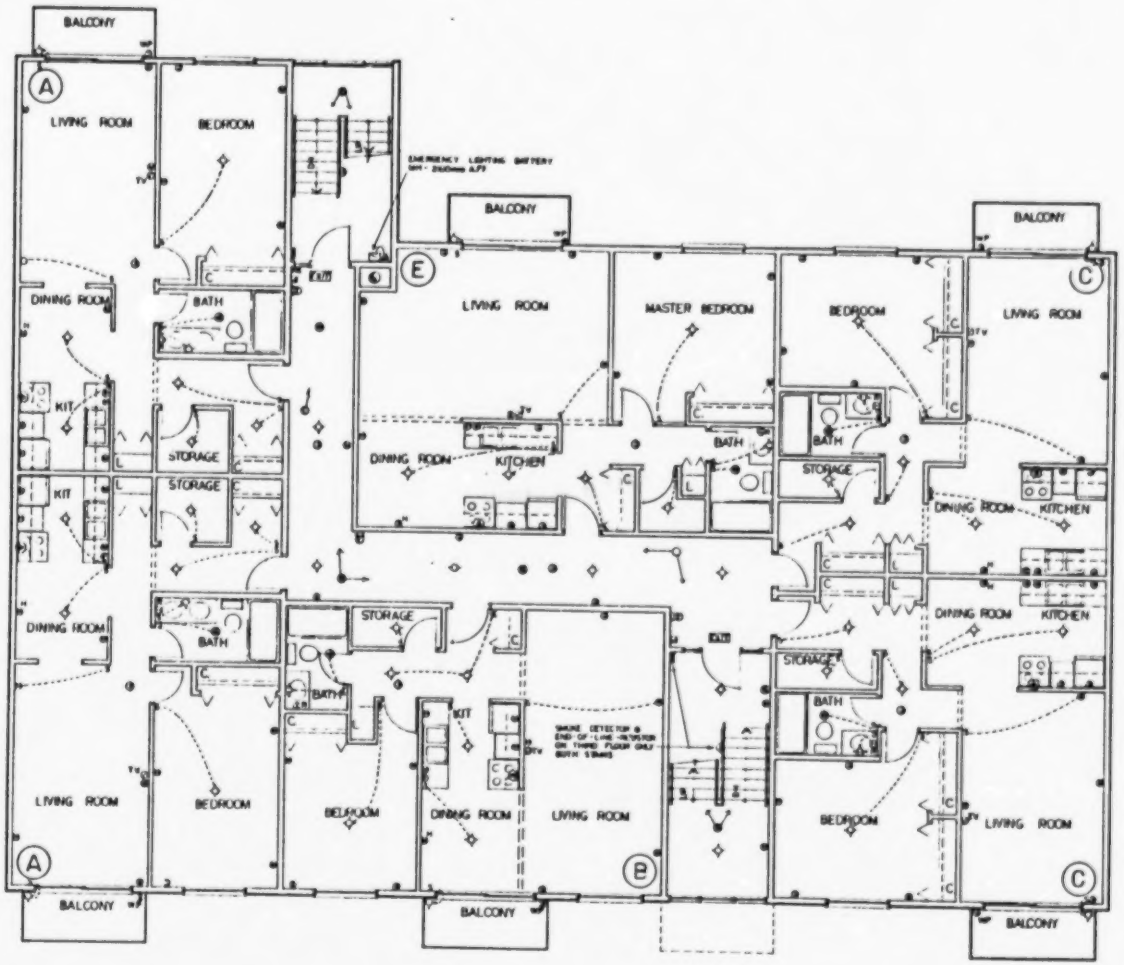
ALBERTA HOUSE COST COMPARISON STUDY

BASEMENT FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1:



ALBERTA HOUSE COST COMPARISON STUDY

MAIN FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1" = 10'



ALBERTA HOUSE COST COMPARISON STUDY

2ND & 3RD FLOOR PLAN
ELECTRICAL LAYOUT
SCALE 1:50